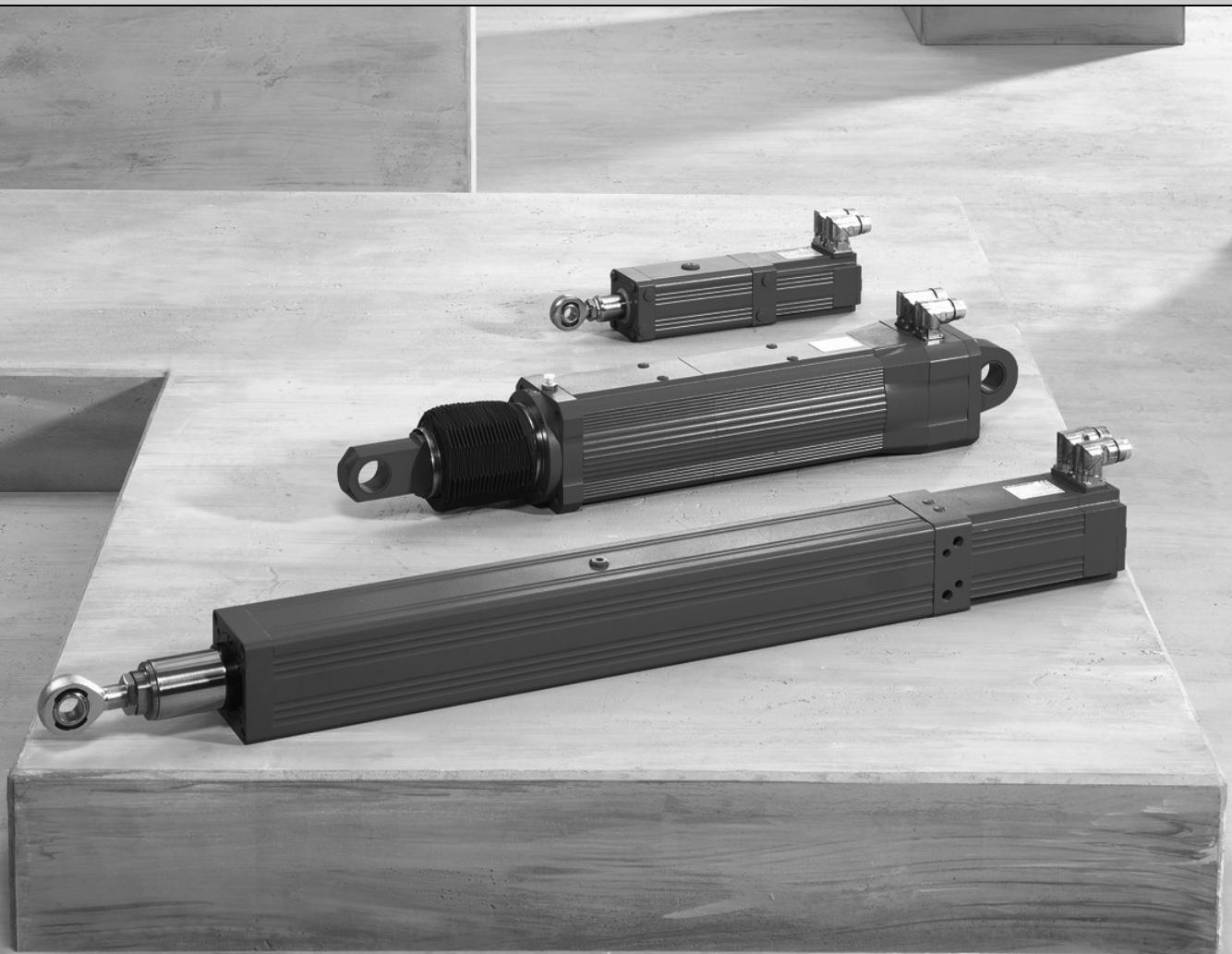




**SEW
EURODRIVE**

Operating Instructions



Servo Technology
CMS50/63/71 Electric Cylinders





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1 General Information

1.1 How to use the operating instructions

Operating instructions are an integral part of the product and contain important information for operation and service. They are intended for staff responsible for the assembly, installation, startup and maintenance of the product.

The operating instructions must be legible and accessible at all times. Make sure that staff responsible for the plant and its operation, as well as persons who work independently on the unit, have read the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, contact SEW-EURODRIVE.

1.2 Structure of the safety notes

1.2.1 Meaning of the signal words

The following table shows the grading and meaning of the signal words for safety notes, notes on potential risks of damage to property, and other notes.

| Signal word | Meaning | Consequences if disregarded |
|--------------------|---|---|
| DANGER | Imminent danger | Severe or fatal injuries |
| WARNING | Possible dangerous situation | Severe or fatal injuries |
| CAUTION | Possible dangerous situation | Minor injuries |
| NOTICE | Possible damage to property | Damage to the drive system or its environment |
| INFORMATION | Useful information or tip: Simplifies the handling of the drive system. | |

1.2.2 Structure of the section-related safety notes

Section safety notes do not apply to a specific action, but to several actions pertaining to one subject. The used symbols indicate either a general or a specific hazard.

This is the formal structure of a section safety note:

SIGNAL WORD

Type and source of danger.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.



1.2.3 Structure of the embedded safety notes

Embedded safety notes are directly integrated in the instructions just before the description of the dangerous action.

This is the formal structure of an embedded safety note:

- **▲ SIGNAL WORD** Nature and source of hazard.

Possible consequence(s) if disregarded.

- Measure(s) to prevent the danger.



General Information

Rights to claim under warranty

1.3 Rights to claim under warranty

A requirement of fault-free operation and fulfillment of any rights to claim under limited warranty is that you adhere to the information in the operating instructions. Therefore, read the operating instructions before you start working with the unit.

1.4 Exclusion of liability

You must comply with the information contained in these operating instructions to ensure safe operation of the electric motors and to achieve the specified product characteristics and performance features. SEW-EURODRIVE assumes no liability for injury to persons or damage to equipment or property resulting from non-observance of these operating instructions. In such cases, any liability for defects is excluded.

1.5 Copyright

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Copyright law prohibits the unauthorized duplication, modification, distribution, and use of this document, in whole or in part.



2 Safety Notes

The following basic safety notes must be read carefully to prevent injury to persons and damage to property. The operator must make sure that the basic safety notes are read and observed. Make sure that persons responsible for the plant and its operation, as well as persons who work independently on the unit, have read through the operating instructions carefully and understood them. If you are unclear about any of the information in this documentation, or if you require further information, please contact SEW-EURODRIVE.

2.1 Preliminary information

The following safety notes are concerned with the use of CMS electric cylinders.

Also observe the supplementary safety notes in the individual sections of this documentation.

2.2 General information



⚠ WARNING

CMS electric cylinders may have live, uninsulated (in case of open connectors/terminal boxes), and sometimes moving or rotating parts as well as hot surfaces during operation.

Severe or fatal injuries.

- All work related to transport, putting into storage, setting up/mounting, connection, startup, maintenance and repair may only be performed by trained personnel observing
 - The relevant detailed operating instructions
 - Warning and safety signs on the motor/gearmotor, all other project planning documents, operating instructions and wiring diagrams belonging to the drive
 - The specific regulations and requirements for the system
 - National / regional regulations governing safety and the prevention of accidents
- Never install damaged products
- Immediately report any damages to the shipping company

Removing the required protection cover or the housing without authorization, improper use as well as incorrect installation or operation may result in severe injuries to persons or damage to property.

Refer to the documentation for additional information.



2.3 Target group

Any mechanical work may only be performed by adequately qualified personnel. Qualified personnel in this context are persons who are familiar with the setup, mechanical installation, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Training in mechanical engineering, e.g. as a mechanic or mechatronics technician (final examinations must have been passed).
- They are familiar with these operating instructions.

Any electric work may only be performed by adequately qualified personnel. Qualified electricians in this context are persons who are familiar with the electronic installation, startup, trouble shooting and maintenance for this product. Further, they are qualified as follows:

- Completed apprenticeship in the field of electrical engineering (e.g. electric or mechatronic technician).
- They are familiar with these operating instructions.

All persons involved in any other work, such as transportation, storage, operation and disposal, must be trained appropriately.

All qualified personnel must wear appropriate protective clothing.

2.4 Designated use

CMS electric cylinders are drive motors designed for use in industrial and commercial systems. Motor loads other than those specified and areas of application other than industrial and commercial systems should only be used after consultation with SEW-EURODRIVE.

The CMS electric cylinders meet the requirements of the low voltage directive 2006/95/EC. Do not take the unit into operation until you have established that the end product complies with the EC Machinery Directive 2006/42/EC.

You must observe the technical data and information on the connection requirements as provided on the nameplate and in the documentation.



2.5 Other applicable documentation

The following publications and documents have to be observed as well:

- Wiring diagrams provided with the motor
- Catalog "CMS50/63/71 Electric Cylinders" and/or

2.6 Transportation/storage

Inspect the shipment for any damage that may have occurred in transit as soon as you receive the delivery. Inform the shipping company immediately. It may be necessary to preclude startup.

Tighten the eyebolts securely. They are designed for the weight of the electric cylinder only; do not attach any additional loads.

The built-in lifting eyebolts comply with DIN 580. Always observe the loads and regulations listed in this standard. If the gearmotor is equipped with two eyebolts, then both of these should be used for transportation. In this case, the tension force vector of the slings must not exceed a 45° angle according to DIN 580.

Use suitable, sufficiently rated handling equipment if necessary. Reattach these in the case of further transportation.

Store the electric cylinder in a dry, dust-free environment if it is not to be installed straight away. The electric cylinder can be stored for one year without requiring any special measures before startup.

2.7 Installation

Adhere to the instructions in section "Mechanical Installation" (starting on page 22) and section "Electrical Installation" (starting on page 37).

The units must be installed and cooled according to the regulations and specifications in the corresponding documentation.

Protect the electric cylinders from excessive strain. Ensure that components are not damaged, particularly during transportation and handling.

The following applications are prohibited unless the unit is explicitly designed for such use:

- Use in potentially explosive atmospheres,
- Use in areas exposed to harmful oils, acids, gases, vapors, dust, radiation, etc.



2.8 Electrical connection

All work may only be carried out by qualified personnel. During work, the low-voltage machine must be on standstill, enabled, and safeguarded against an accidental restart. This also applies to auxiliary circuits (e.g. anti-condensation heating or forced cooling fan).

Check that the motor is de-energized!

Exceeding the tolerances in EN 60034-1 (VDE 0530, part 1) - voltage + 5%, frequency + 2%, curve shape, symmetry - increases the heating and influences electromagnetic compatibility. Also observe EN 50110 (and, if applicable, other national regulations, such as DIN VDE 0105 for Germany).

Observe the wiring information and differing data on the nameplate as well as the wiring diagram provided with the motor.

The connection should be a continuous secure electrical connection (no protruding wire ends); use the cable end equipment intended for this purpose. Establish a secure protective earth connection. When the motor is connected, the distances to non-insulated and live parts must not be shorter than the minimum values according to IEC 60664 and national regulations. With low voltage, the distances should be no shorter than the following values, in compliance with IEC 60664:

| Nominal voltage V_N | Distance |
|-----------------------|----------|
| $\leq 500 \text{ V}$ | 3 mm |
| $\leq 690 \text{ V}$ | 5.5 mm |

The terminal box must be free of foreign objects, dirt and humidity. Unused cable entry openings and the box itself must be closed so that they are dust and water proof. Secure keys for test mode without output elements. When operating low-voltage machines with brakes, check that the brake is functioning correctly before startup.

Observe the instructions in section "Electrical Installation" (page 37).

2.9 Startup/operation

Whenever changes to normal operation occur, such as increased temperatures, noise, vibrations, etc., you should determine the cause. Consult the manufacturer if required. Never deactivate protection devices, even in test mode. Switch off the motor if you are not sure.

Regularly clean air ducts in dusty or dirty environments.

Refer to the information in section "Startup", see page 53.

2.9.1 Hot surfaces

The motors get very hot during operation.

Touching the motor when it has not cooled down could result in burns. The motor can have a surface temperature of more than 100 °C during normal operation.

Never touch the motor during operation or in the cool down phase once it has been switched off.

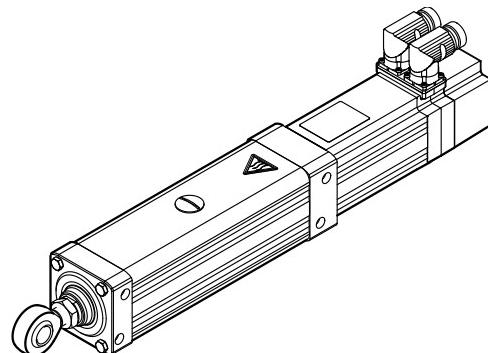


3 Structure of the Electric Cylinders

3.1 Sizes

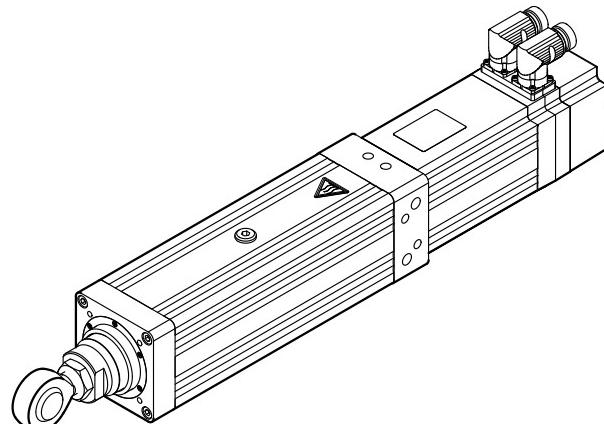
SEW-EURODRIVE offers **three product variants**:

3.1.1 CMS50S/M



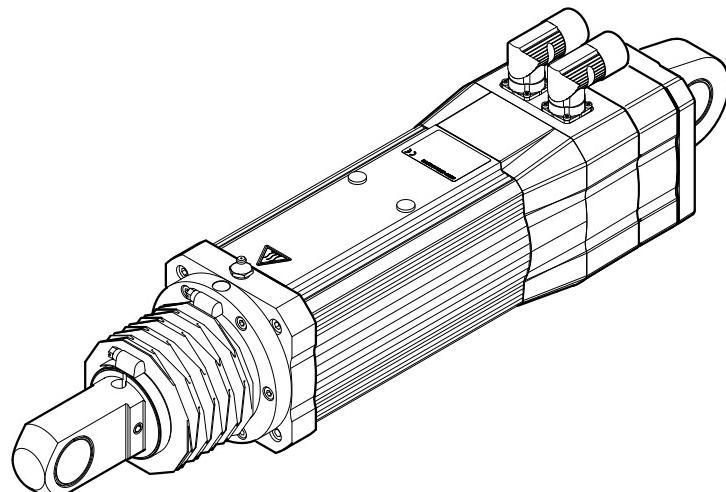
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3.1.2 CMS63S/M



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3.1.3 CMS71L



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3.2 Functional description

3.2.1 General information

Synchronous servomotors of the SEW CM/CMP motor series are used as the basis for the CMS electric cylinder series.

The service life of the electric cylinders (threaded spindle and bearings) must be taken into account, as it depends on the load cycle and travel cycle. The electric cylinders are equipped with a resolver that serves as a speed and position encoder. The absolute encoder (Hiperface® encoder) is available as an option. In connection with a servo inverter, you can freely define acceleration, velocity, position and force profiles.

The repeat accuracy is 5/100 mm, if force and temperature are constant. The electric cylinders are available with or without brakes (holding brake only). The motor is available with plug connector only (no terminal box). The connector type CMP motor series is used (for resolver, Hiperface® encoder and power).

3.2.2 CMS50S/M

A CMP50S/M servomotor is used for the drive. An add-on component, comprising a screw drive and guide, is flanged onto the unit. All components and options of the motor, except the flanged endshield and the rotor (due to the larger bearing), are adopted from the CMP.

As standard, the drive is adapted to the customer's application through the flanged endshield on the A side of the motor. The rotor turns the threaded spindle while the nut remains fixed. The nut is routed in an aluminum extruded housing via T-slot nuts.

The nut and piston rod are connected to each other. The piston rod has a smooth, high-quality corrosion-proof surface and is sealed using a wiper with guide ring. The joint head is connected to the piston rod. The spindle nut has a lubricant reservoir, which extends the relubrication interval. The relubrication can also be carried out by a greasing nipple.

3.2.3 CMS63S/M

A CMP63S/M servomotor is used for the drive. An add-on component, comprising a screw drive and guide, is flanged onto the unit. All components and options of the motor, except the flanged endshield and the rotor (due to the larger bearing), are adopted from the CMP.

As standard, the drive is adapted to the customer's application through the flanged endshield on the A side of the motor. The rotor turns the threaded spindle while the nut remains fixed. The nut is routed in an aluminum extruded housing via T-slot nuts.

The nut and piston rod are connected to each other. The piston rod has a smooth, high-quality corrosion-proof surface and is sealed with a sealing system. The joint head is connected to the piston rod. An oil bath lubrication system supplies the bearing points, threaded spindle and seals with lubricant.



3.2.4 CMS71L

Synchronous servomotors of the SEW CM/CMP motor series are used as the basis for the CMS71L electric cylinder series.

The rotors are designed as a hollow shaft. The spindle nut of the recirculating ball screw or planetary roller screw drive is attached to the rotor. Depending on the direction of motor rotation, the threaded spindle is moved out of or into the rotor. The threaded spindle must be prevented from turning, so that the rotary motion of the rotor (spindle nut) is transformed into a linear motion. The threaded spindle is protected from "heavy" contamination by a bellows.



Structure of the Electric Cylinders

Type designation

3.3 Type designation

The following characteristic unit data can be read from the type designation of the electric cylinder:

Example: CMS50S electric cylinder

| CMS | 50S | /BP | /KY | /RH1M | /SB1 | /VR |
|-----|-----|-----|-----|-------|------|-----|
| | | | | | | |

Ventilation:
VR = Forced cooling fan

Plug connector:
/SM1 = Motor
/SB1 = Brakemotor

Encoder system:
/RH1M = Resolver, 2-pole
/AS1H = Absolute encoder (Hiperface® multi-turn)
/ES1H = Absolute encoder (Hiperface® single-turn)
/AKOH = Absolute encoder (Hiperface®, multi-turn)

Motor protection/temperature detection:
/TF = Temperature sensor (posistor or PTC resistor)
/TH = Thermostat (bimetallic switch)
/KY¹⁾ = KTY84-130 sensor

Brake:
/BP = CMS50S, 24 V holding brake
/BP = CMS63S/M, 24 V holding brake
/BS = CMS71L, 24 V holding brake

Size:
50S/50M
63S/63M
71L

Type:
CMS = Electric cylinder

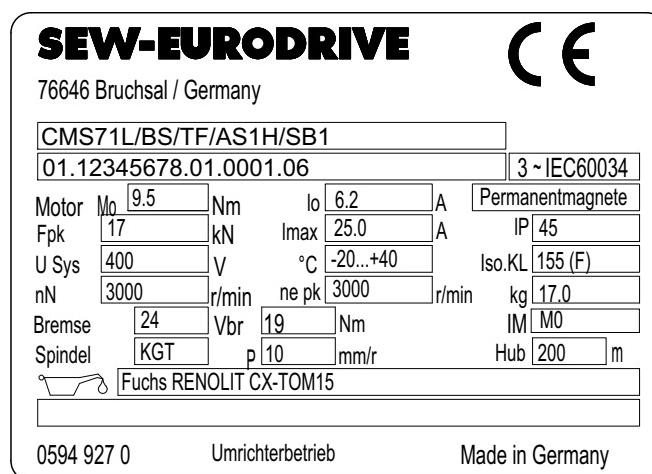
1) CMS50 and CMS63 are only available with KTY



3.4 Nameplate

Each electric cylinder has a nameplate that provides important information. The following figure shows an example of a nameplate.

Example



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| | |
|------------------|---|
| Type | Motor type |
| No. | Serial number |
| M ₀ | Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm) |
| I ₀ | Standstill current |
| Fpk | Peak feed force |
| I _{max} | Maximum permitted motor current |
| IP | Degree of protection |
| U Sys | Motor voltage |
| °C | Ambient temperature range |
| Insul. cl. | Thermal class |
| nN | Rated speed |
| ne pk | Maximum mechanically permitted speed |
| kg | Weight |
| Brake | Nominal voltage of the brake/braking torque |
| Spindle | Spindle type |
| P | Spindle pitch |
| Stroke | Stroke length |
| IM | Mounting position |
| | Lubricant |



3.5 Scope of delivery

INFORMATION



- The delivery of the electric cylinder with recirculating ball screw (KGT) takes 3 weeks.
- The delivery time for electric cylinders with planetary roller screw drive (PGT) is 8 weeks.

3.5.1 CMS50S/M

- Electric cylinder with smooth piston rod
- 4 fit bolts included
- Plug connector
- Various optional connecting parts (fixed mount-on components, pivot bearings)

3.5.2 CMS63S/M

- Electric cylinder with smooth piston rod
- Prepared for flange mounting, 4 screws and 4 pins included
- Plug connector
- Various optional connecting parts (fixed mount-on components, pivot bearings)

3.5.3 CMS71L

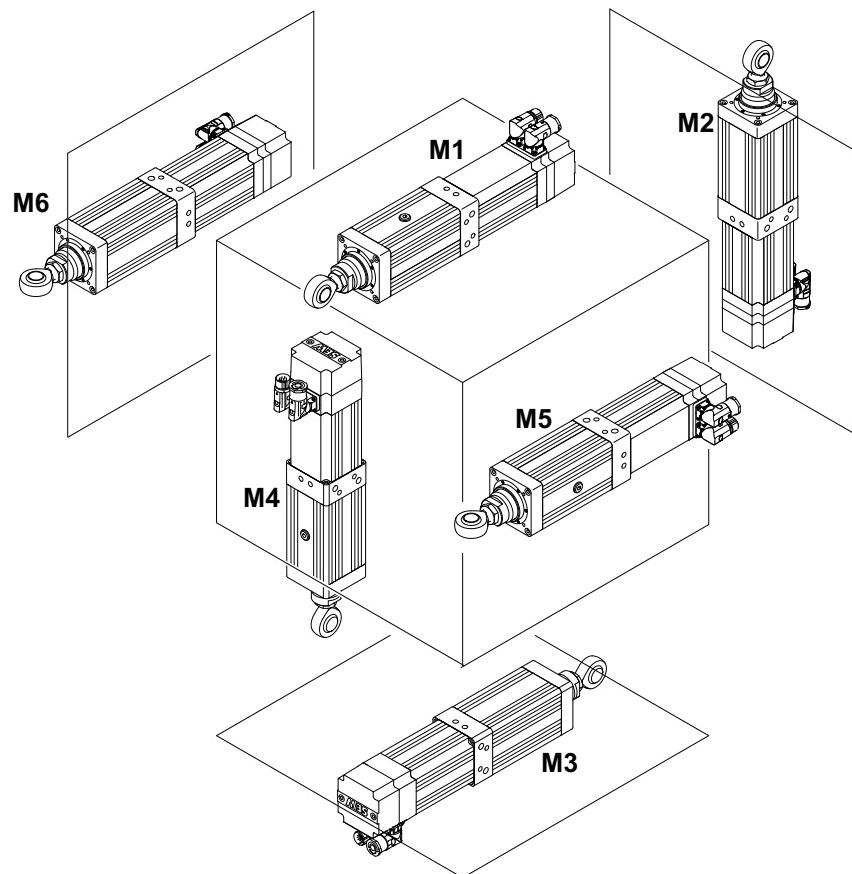
- Electric cylinder with assembled threaded spindle and bellows
- Mechanical connecting parts with plain bearing bush (rod end bearing, optional cardan joint)
- Fixed lubrication connection option (optional preassembled lubrication device)
- Plug connector



3.6 Mounting positions

All mounting positions (M0) are possible for CMS50 and CMS71 electric cylinders. CMS63 in mounting position M4 requires the option on page 28.

The following figure shows the spatial orientation of the CMS63S/M electric cylinder.



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Structure of the Electric Cylinders

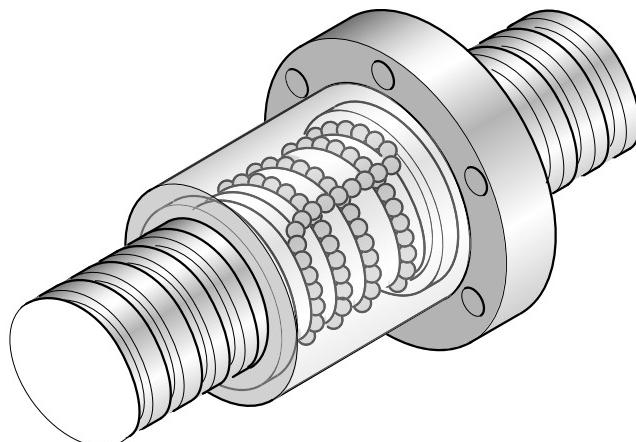
Ball screw and planetary roller screw drive – operating principle

3.7 Ball screw and planetary roller screw drive – operating principle

We differentiate between the two following threaded spindle types for electric cylinders:

3.7.1 Recirculating ball screw (KGT)

The recirculating ball screw is used in the **CMS50S/M**, **CM63S/M** and **CMS71L** electric cylinders.



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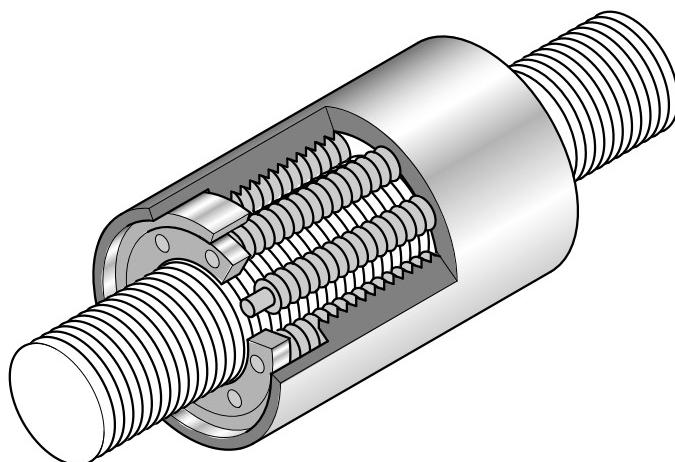
The recirculating ball screw transfers the load from the threaded spindle to the nut via ball bearings (power transmission by ball bearings).

3.7.2 Planetary roller screw drive (PGT)

The planetary roller screw drive is used in the **CM63S/M**, **CMS71L** electric cylinders.

Preferred application areas:

- Low feed rate and high force
- Unfavorable operating conditions, such as die cutting



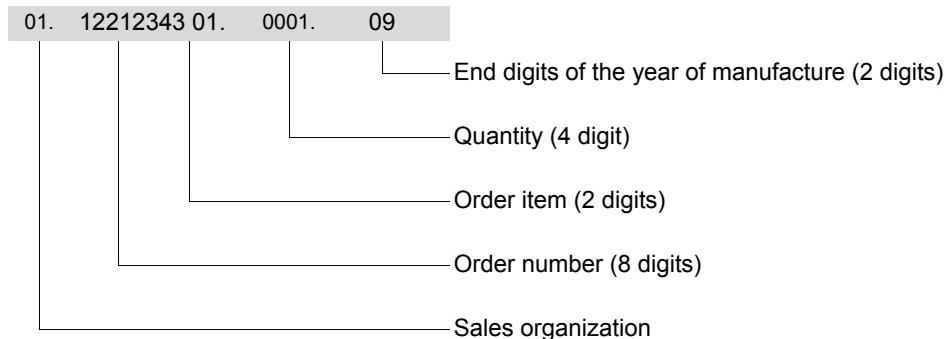
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The planetary roller screw drive transfers the load from the threaded spindle to the nut via the convex thread edges of rollers (power transmission by planetary rollers).



3.8 Serial number

The following information can be read from the serial number of the electric cylinder:



3.9 Standards

Conformity with directives

The electric cylinders from SEW-EURODRIVE conform to the relevant standards and regulations, in particular to:

- Low Voltage Directive 2006/95/EC
- Machinery Directive 98/37/EC
- EMC Directive 2004/108/EC
- CSA C22.2 No.100-04
- UL 1004

3.10 Storage conditions

Electric cylinders are treated with an anti-corrosion agent as standard.

The motor parts are protected against corrosion for two years when stored in unopened original packaging (with Vario lubrication system one year → battery life).

Observe the following storage conditions for CMS electric cylinders:

- Store CMS electric cylinders indoors
- Keep storage area clean and dry
- Maintain a storage temperature between -10 °C and +70 °C
- Relative humidity must not exceed 95%
- Original packaging must not be damaged

3.11 Coating

- The standard color is RAL 9005 black
- Optional surface protection



3.12 Operating temperatures

The electric cylinders are designed for use in a temperature range between -20 °C and +40 °C.

Contact SEW-EURODRIVE if the motors are operated outside the specified temperature range.

3.13 Surface protection

In addition to standard surface protection, electric cylinders are available with surface protection OS1.

| Surface protection | Ambient conditions | Sample applications |
|--------------------|---|---|
| Standard | Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres. According to corrosivity category ¹⁾ : • C1 (negligible) | <ul style="list-style-type: none"> Machines and systems in the automobile industry Transport systems in logistics Conveyor belts at airports |
| OS1 | Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. According to corrosivity category ¹⁾ : • C2 (low) | <ul style="list-style-type: none"> Systems in saw mills Hall gates Agitators and mixers |

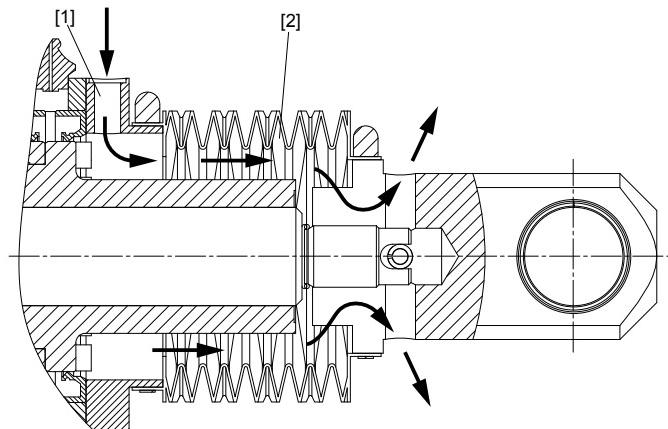
1) to DIN EN ISO 12944-2 classification of ambient conditions



3.14 Sealing air

The drive is factory-equipped with a sealing air connection [1], thread G1/8 as standard. This is why the electric cylinder can be used in dusty environments in particular.

In this case, the space within the bellows [2] can be placed under slight positive pressure (max. 0.5 bar). The positive pressure prevents dust, etc., from entering the motor.



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- [1] Sealing air connection
- [2] Bellows

The required compressed air volume flow ($V_{\text{sealing air}}$) depends on the travel velocity (v) of the screw drive.

| $V_{\text{sealing air}} \geq 300 \text{ v}$ | Volume flow $V_{\text{sealing air}}$ [liters/min] |
|---|---|
| | Travel speed v [m/s] |

This ensures that sufficient pressurized air flows in during extension and that no negative pressure develops in the space [2].

The pressurized air must be dry and free of oil, according to DIN-ISO 8573-1 class 3 (common in pressurized air systems).



4 Mechanical Installation

4.1 Before you start

Install the drive only if the following conditions are met:

- The drive must be undamaged (no damage caused by shipping or storage).
- The specifications on the nameplate of the drive correspond to the supply system or the output voltage of the servo inverter.
- The ambient temperature is between -20 °C and +40 °C.
- The installation altitude must be no higher than 1000 m above MSL, otherwise the drive must be designed to meet the special environmental conditions.
- The surrounding area is free from oils, acids, gases, vapors, radiation, etc.

4.2 Required tools/resources

- Standard tools
- For plug connectors assembled by the customer:
 - Crimping pliers up to 10 mm² cable cross section
 - Crimping pliers from 16 mm² cable cross section
- For delivery until 12/2008: Removal tool for insulator when changing the plug connector.
- For delivery as of 01/2009: No tool required for right-angle plug connector.



4.3 *Installing the electric cylinder*

⚠ WARNING



Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.

⚠ CAUTION



The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

NOTICE



Improper mounting may result in damages to the electric cylinder.

Possible damage to property.

- Note the following:
 - Mount the electric cylinder only on a level, vibration-free and torsionally rigid support structure.
 - Make sure the customer's counter-bearing is unobstructed and can move freely.
 - Carefully align the electric cylinder and the driven machine to avoid placing any unacceptable strain on the spindle (observe permissible axial load data). Observe the notes in section 5.
 - Make sure that the electric cylinder is not subject to overhung loads and bending moments.
 - Do not jolt or hammer the spindle end.
 - Protect the bellows and threaded spindle against mechanical damage.
 - Mount the electric cylinder in the specified mounting position only.
 - Make sure that it does not reuse the air warmed by other devices.

4.3.1 **Installation in damp areas or in the open**

- Try to arrange the motor and encoder connection so that the connector cables do not point upwards.
- Clean the sealing surfaces of the connector (motor or encoder connection) before re-assembly.
- Replace any brittle seals.
- If necessary, restore the anticorrosive paint coat.
- Check that the degree of protection is maintained.
- If necessary, attach covers (protection canopy).



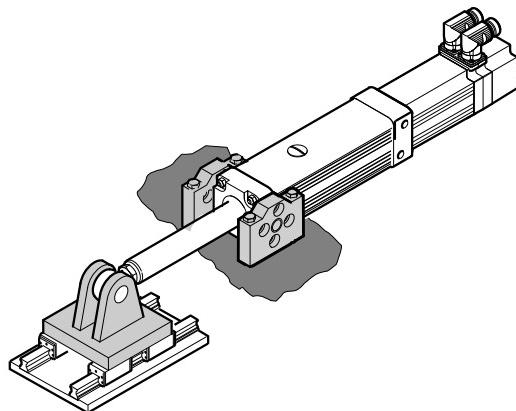
Mechanical Installation

Mounting situation at customer site

4.4 Mounting situation at customer site

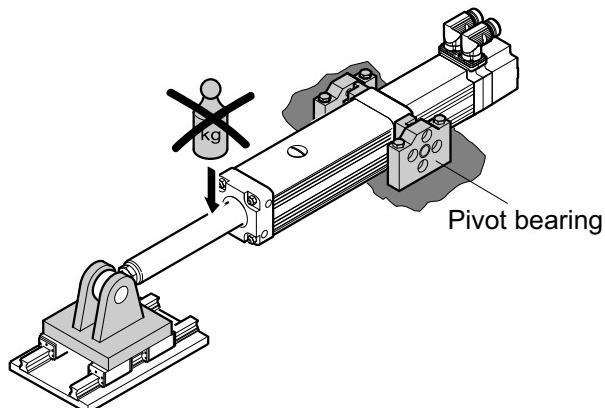
4.4.1 CMS50/CMS63 installation notes

- Attachment only on the output side of the piston rod is permitted only for the CMS types
 - CMS50S with 70 mm stroke
 - CMS63S with 100 mm stroke
- with/without brake.



65731AXX

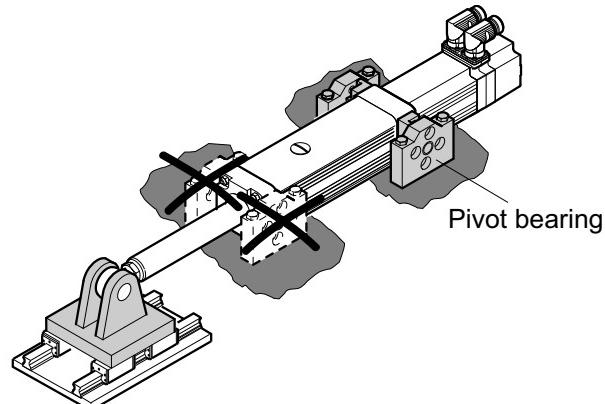
- No overhung loads on the drive



61369AEN

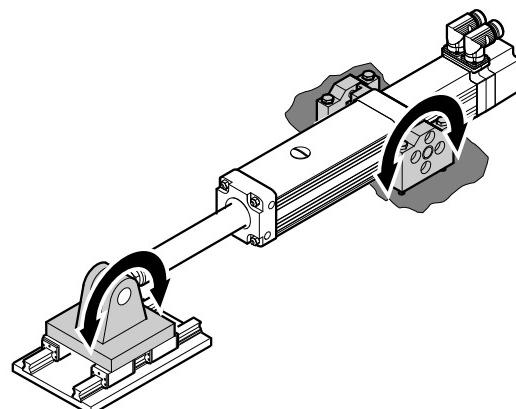


- No statically redundant mounting. When using a pivot bearing, do not use additional attachments.



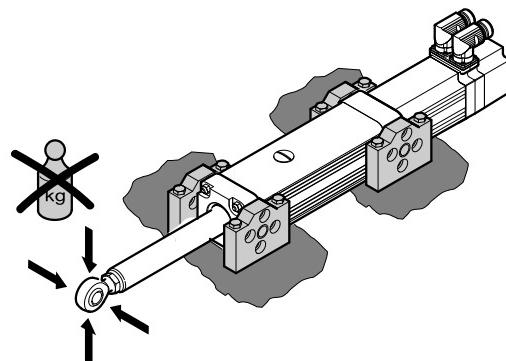
61372AEN

- Joint must be free to move; do not clamp in place.



61371AXX

- No overhung loads on the drive



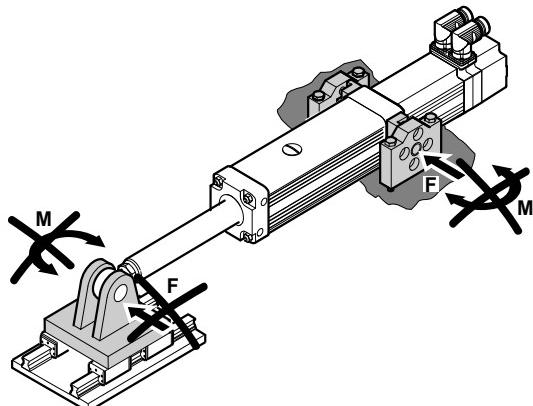
61379AXX



Mechanical Installation

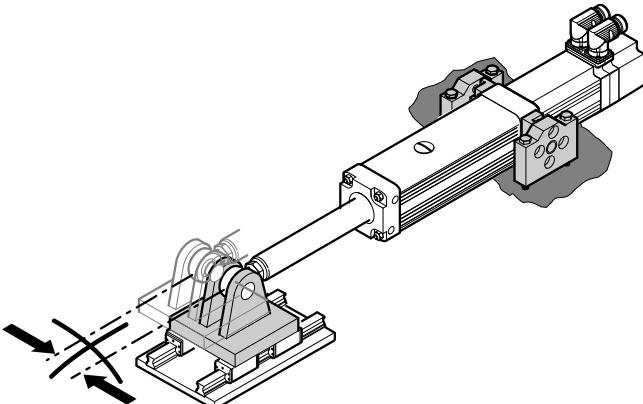
Mounting situation at customer site

- Do not induce loads and torques via joints



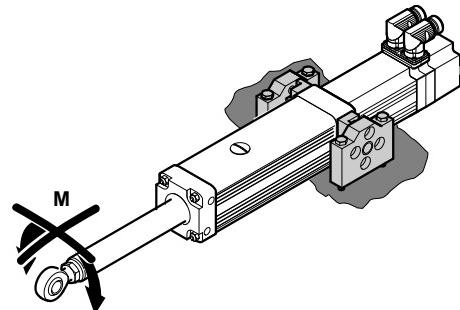
61374AXX

- Do not offset the installed components.



61376AXX

- Do not induce torque loads over the piston rod.

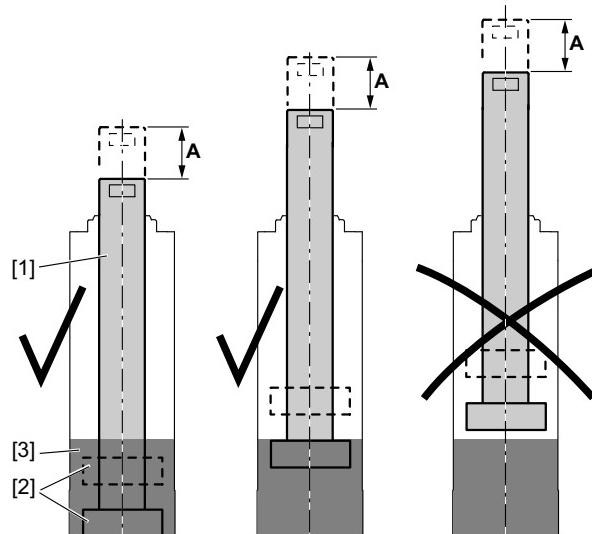


61377AXX



4.4.2 Mounting situation and stroke range for CMS63

When mounting the electric cylinder, note that the spindle nut is not lubricated in case of incorrect stroke setting. For short working strokes [A], the end position of the spindle nut [2] must be lower than half the stroke length.



68460AXX

[1] Piston rod

[3] Oil

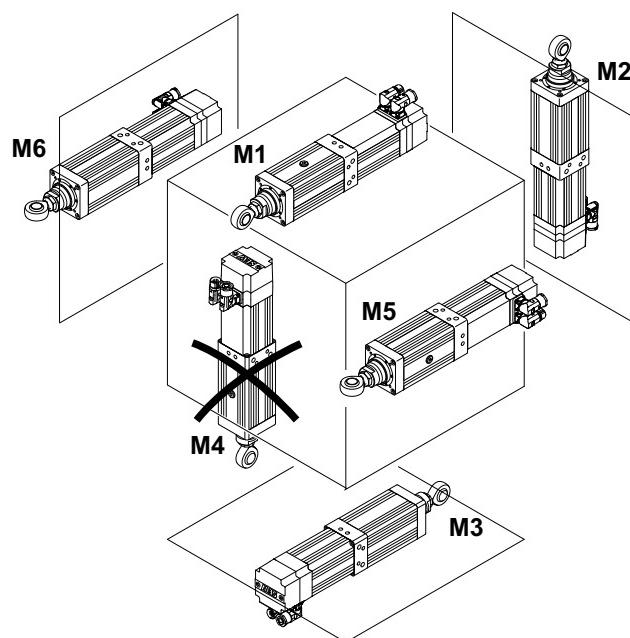
[2] Spindle nut

Electric cylinders in M4 mounting position must not be mounted with the piston rod at the bottom.

INFORMATION



If you require this M4 mounting position with the piston rod at the bottom, select the drive with M0 mounting position option (all mounting positions from M1 - M6), see next page.



68459AXX



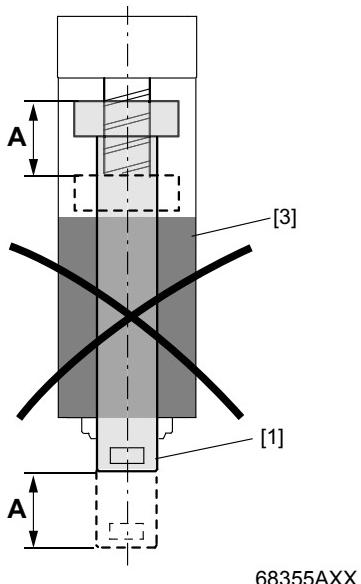
Option: M0 mounting position (all mounting positions from M1 to M6) for CMS63

For applications where the piston rod extends from the bottom, an integrated lubricant pump can be ordered via "M0 mounting position" option to ensure lubrication.

The pumping effect off the piston rod is used via internal valves to supply oil to the bearings of the electric cylinder.

- Observe the following restrictions:
 - Operating temperature -10 °C to +40 °C
 - Minimum speed 180 rpm
 - for lower temperatures up to -20°C, minimum speed 500 rpm
 - Min. working stroke 50 mm

- Observe the following stroke settings when installing the electric cylinder.
 - Short, permanent working strokes [A] from retracted piston rod position [1], above medium stroke position (above the oil level) [3]), are not permitted.



INFORMATION



For applications with the working stroke above the oil level, please contact SEW-EURODRIVE.

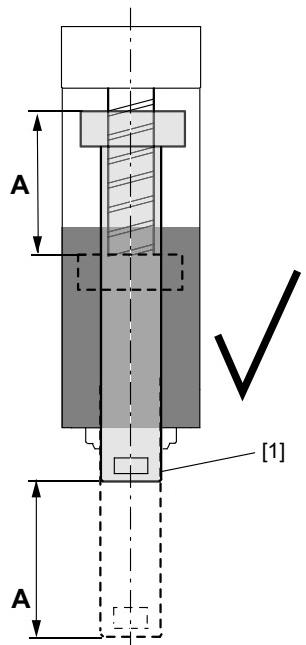
INFORMATION



Please note that the following restrictions are of a general nature. Further, the lubrication system provides a larger power spectrum that has to be evaluated for the individual applications consult SEW-EURODRIVE.

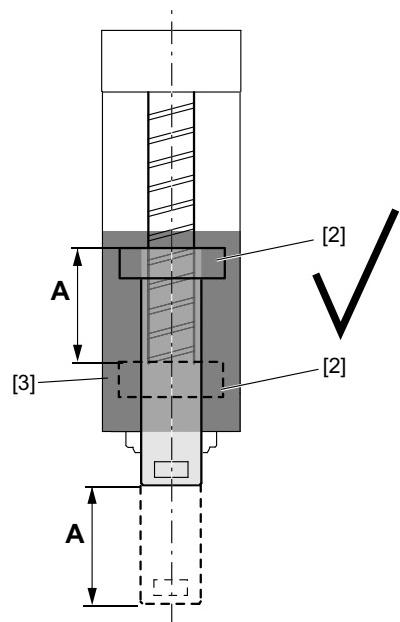


- Working strokes [A] from retracted piston rod position [1] must be extended at least up to half the stroke length +25 mm.



68360AXX

- Working strokes [A] below the medium stroke position of the nominal stroke are permitted if the spindle nut [2] is completely immersed in the oil [3]. The working stroke "A" must be at least 8 mm.



68556AXX

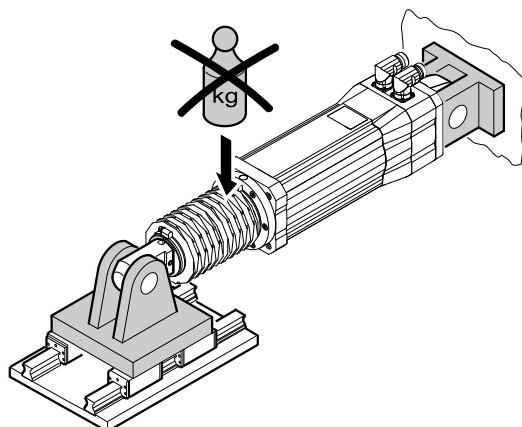


Mechanical Installation

Mounting situation at customer site

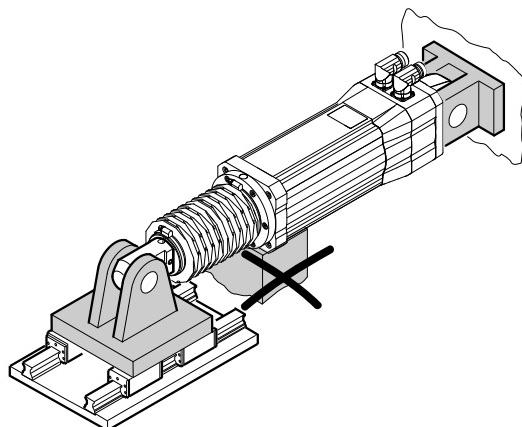
4.4.3 CMS71L installation notes

- No overhung loads on the drive



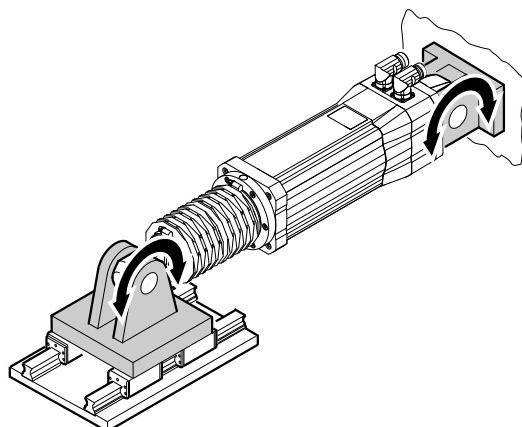
61173AXX

- No additional fastenings or supports (statically redundant)



61174AXX

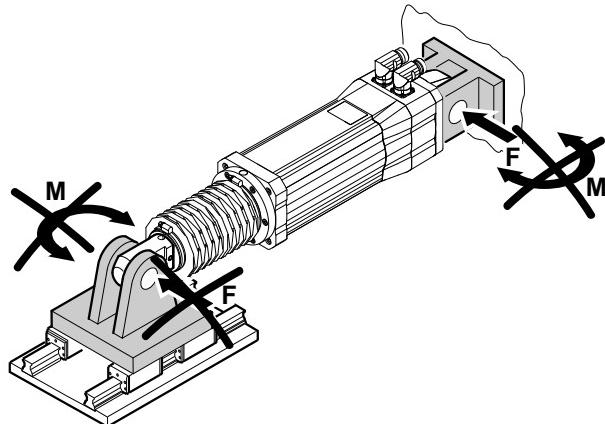
- Joints must be free to move; do not clamp in place.



61175AXX

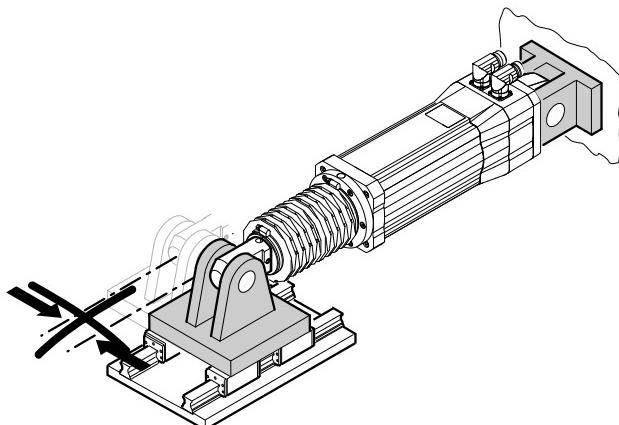


- Do not induce loads and torques via joints.



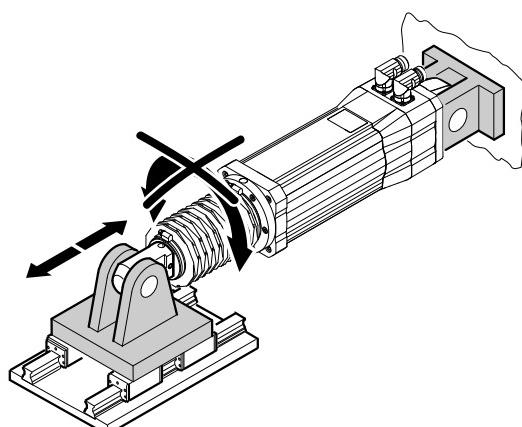
61176AXX

- Do not offset from the mounting position, see installation tolerances on page 34



61177AXX

- Install so that the unit is not subject to torque (torsion).



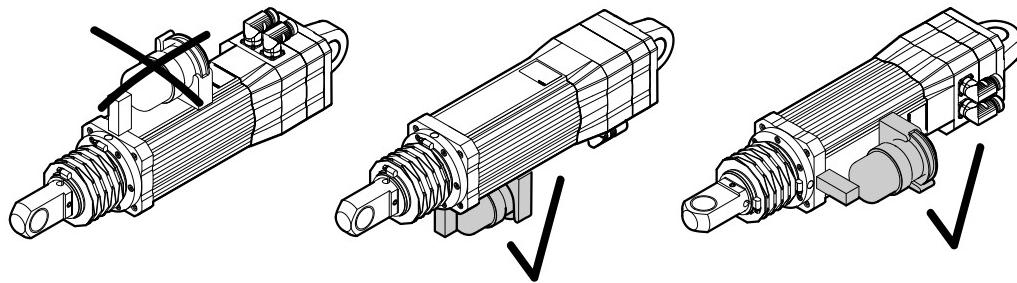
61178AXX



Mechanical Installation

Mounting situation at customer site

- For **horizontal** mounting position with lubricator option: position lubricator on the side or bottom. If this mounting situation cannot be avoided, contact SEW-EURODRIVE.



61504AXX

INFORMATION

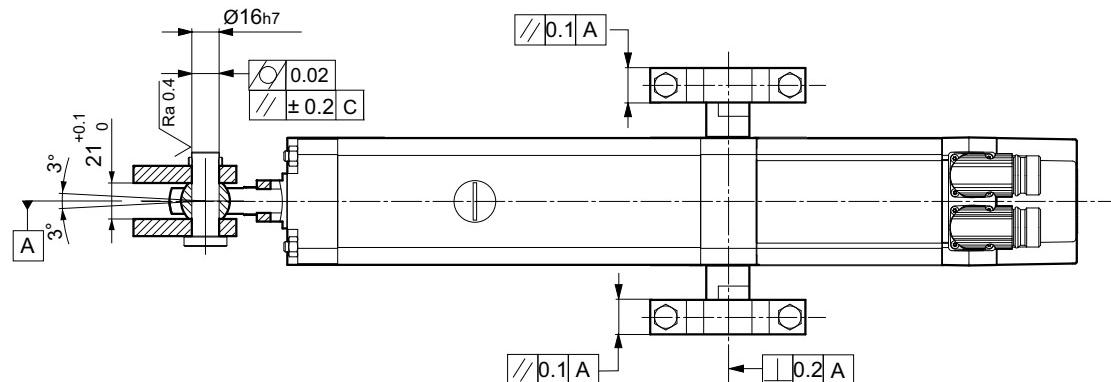


In case of high thermal loads, dissipated heat can affect the lubricant properties.



4.4.4 Tolerances for mounting the CMS50S/M at the customer site

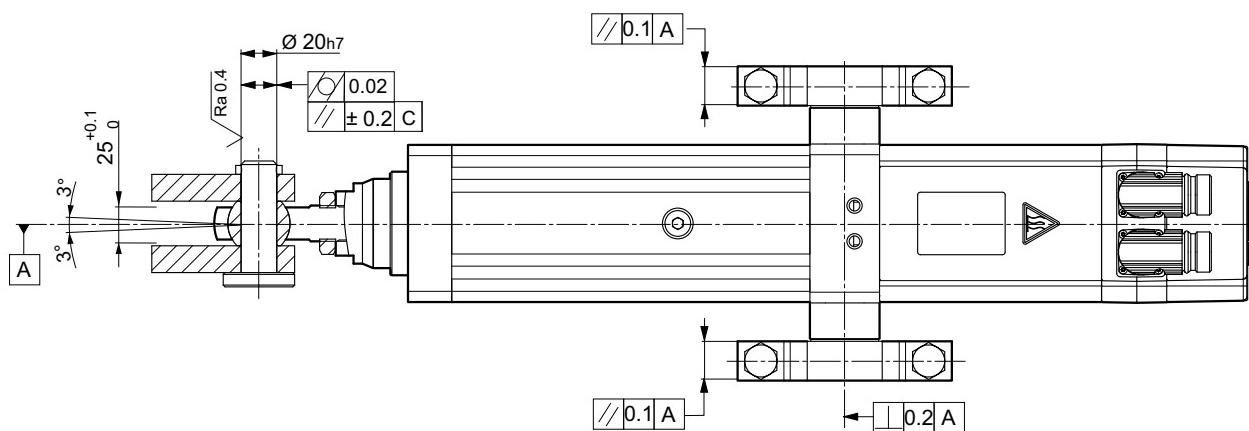
The following figure describes the mounting situation for both mounting sides of the drive.



61542AXX

4.4.5 Tolerances for mounting the CMS63S/M at the customer site

The following figure describes the mounting situation for both mounting sides of the drive.



65190AXX



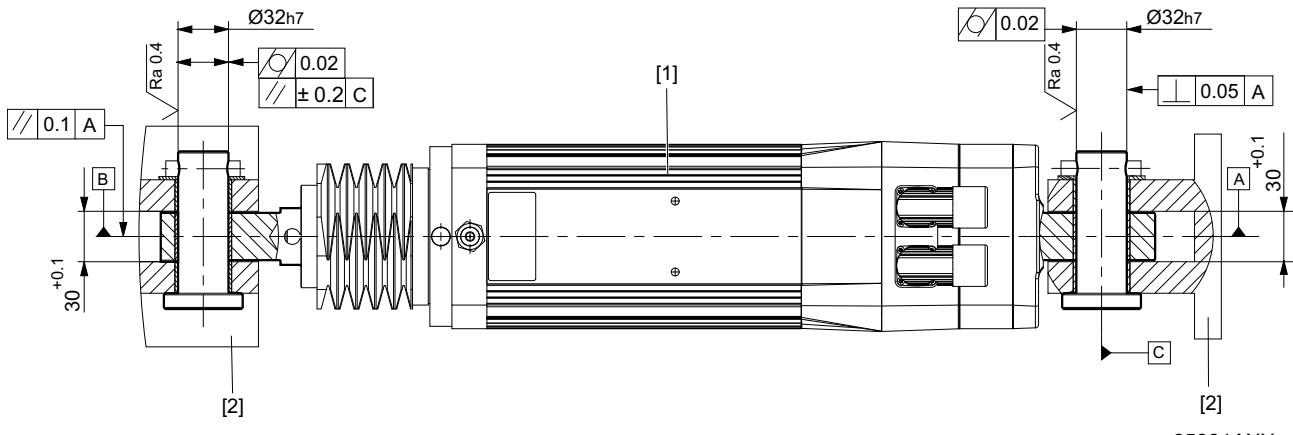
Mechanical Installation

Mounting situation at customer site

4.4.6 Tolerances for mounting the CMS71L at the customer site

The following figure describes the mounting situation for both mounting sides of the drive.

Standard



- [1] CMS electric cylinder
- [2] Customer-supplied parts

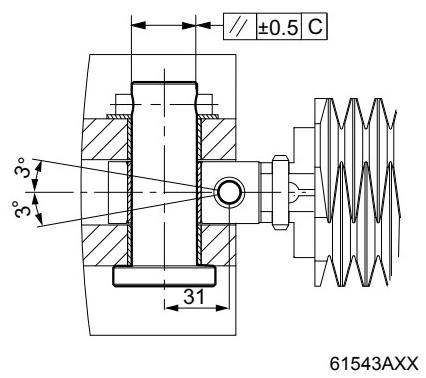
Note the following points:

INFORMATION



- The max. axial offset between A-B is ± 0.2 mm
- The parts supplied by the customer must meet the requirements described above.
- If mounting tolerances cannot be complied with, contact SEW-EURODRIVE. An electric cylinder with a cardan joint might fit the mounting situation.

Cardan joint



Note the following points:

INFORMATION



- The max. axial offset between A-B is ± 0.5 mm



4.5 Mechanical stroke limiting

INFORMATION



The customer must limit the stroke of the electric cylinder by providing for appropriate measures in the extended and retracted position, e.g. by using limit stops, cushioning or shock absorbers.

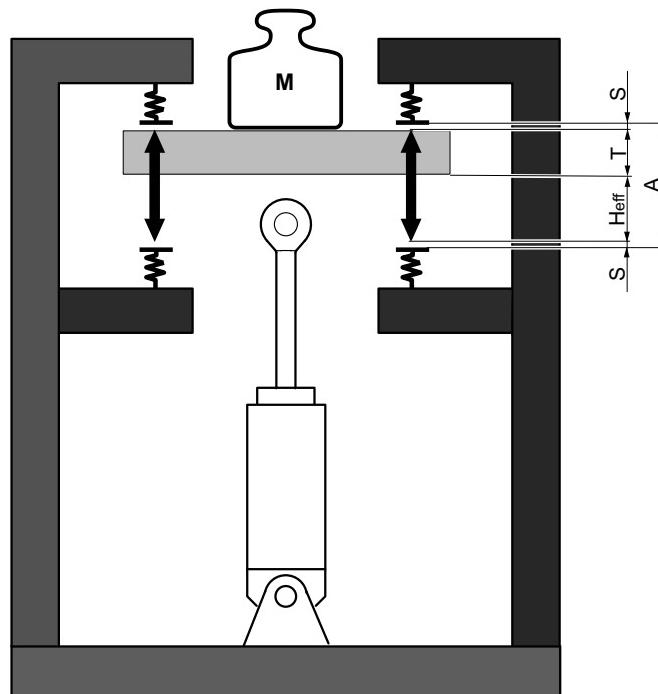
The mechanical limiting elements built-in by the customer must be able to absorb the reactive forces and kinetic energy that is created when the end position stops are reached in order to prevent the maximum permitted feed thrust of the electric cylinder from being exceeded. This requires soft, damping elements. Their purpose is to absorb the energy and then limit the end position mechanically. As a rule, you should use cushioning or shock absorbers that are dimensioned accordingly.

4.5.1 Mechanical stroke limiting

INFORMATION



The rated stroke length (H_{CMS}), e.g. CMS71L stroke 200 mm, is only available in limited form for the customer application because safety distances (S) to the limit stops restrict the effective stroke (H_{eff}).



| | |
|---------------|--------------------|
| [H_{eff}] | Effective stroke |
| [H_{CMS}] | Nominal stroke CMS |
| [S] | Safety distance |

| | |
|---------|------------------------------|
| [A] | Distance between limit stops |
| [T] | Partial width |
| [M] | Mass |

Calculating the effective stroke

The effective stroke can be calculated as follows:

$$H_{eff} = A - T - 2 \times S$$

or

$$H_{eff} = H_{CMS} - 2 \times S$$

$$\rightarrow H_{eff} < H_{CMS}$$



4.6 VR forced cooling fan

The synchronous servomotors size CMP50-63 and CMP.71-100 can be equipped with a VR forced cooling fan as an option.

INFORMATION



The forced cooling fan can only be used up to a maximum oscillation and shock load of 1 g.

4.6.1 Mechanical Installation

Mounting the fan guard for the VR forced cooling fan:

| Motor | Screws | Tightening torque |
|--------------|----------------------|-------------------|
| CMS50, CMS63 | M4 × 8, self-tapping | 4 Nm |



5 Electrical Installation



⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

- Note the following:

- It is essential to comply with the safety notes in Sec. 2 during installation!
- Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake.
- Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- It is essential to observe the operating instructions supplied with the servo inverter.



NOTICE

Use switch contacts in utilization category AC-3 to EN 60947-4-1 for connecting the electric cylinder and brake.

Use switch contacts in utilization category DC-3 to EN 60947-4-1 for connecting the brake to DC 24 V.



INFORMATION

- A bag containing the following information is attached to the electric cylinder:
 - Safety notes
 - Wiring diagram

Observe these notes.

5.1 Additional regulations

The generally applicable installation regulations for low-voltage electric equipment (such as DIN IEC 60364, DIN EN 50110) must be complied with when setting up electrical machinery.

5.2 Compulsory use of the wiring diagrams

Connect the motor only as shown in the wiring diagram(s) included with the motor. **You must not connect or start up the motor if the wiring diagram is missing.** You can obtain the valid wiring diagrams from SEW-EURODRIVE free of charge.



5.3 Wiring information

5.3.1 Protecting the brake control system against interference

To protect the brake control system against interference, do not route unshielded brake cables together with switched-mode power cables.

Switched-mode power cables include in particular:

- Output cables from servo inverters, converters, soft start units and brake units
- Supply cables for braking resistors and similar options

5.3.2 Thermal motor protection

NOTICE



Electromagnetic interference of the drives.

Possible damage to property.

- Install the connecting lead of the KTY separately from other power cables, maintaining a distance of at least 200 mm. The cables can only be routed together if either the KTY cable or the power cable is shielded.



5.4 Connector installation

The cable entry of the power and signal cable is installed using an adjustable right-angle connector. Once the mating connector has been plugged in, the right-angle connector can be adjusted as required without using additional tools. A torque of > 8 Nm is required to adjust the connector.

NOTICE



Damage of the right-angle connector in case of rotation without mating connector.

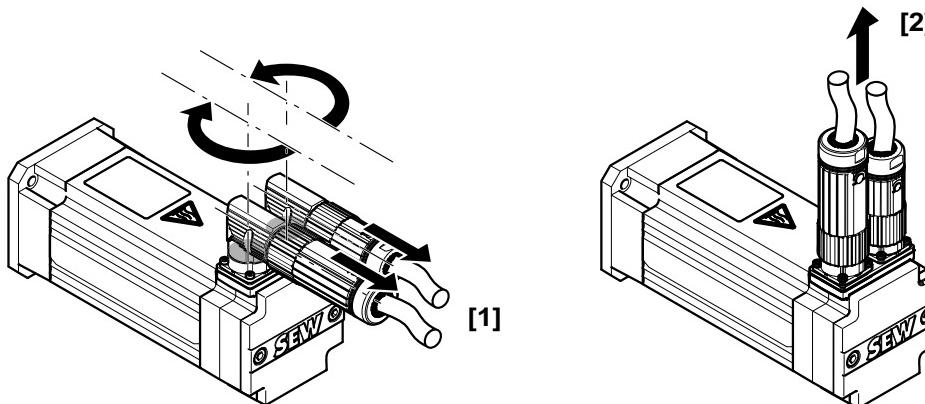
Possible damage to property.

- Do not use pliers to adjust the right-angle connector before connecting it. This might damage the thread and the sealing surface.

5.4.1 Connector position

An "adjustable" position has been defined for right-angle, adjustable connectors [1]. This is the standard connector position. It corresponds to connector position "3".

A "radial" position has been defined for the straight plug connectors (radial output). Radial plug connectors [2] are optional.



63831AXX

[1] Connector position "adjustable"

[2] Connector position "radial"

INFORMATION



- Comply with the permitted bending radii of the cables.
- When using low-capacity trailing cables, the bending radii are larger than for the previously used standard cables.
- SEW-EURODRIVE recommends the use of low-capacity cables.



Electrical Installation Connector installation

The right-angle plug connectors can be rotated to achieve the required position.

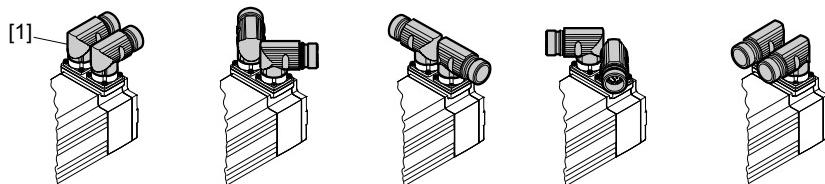
INFORMATION



The connector should only be rotated to install and connect the motor.

Do not turn the plug connector regularly once it has been installed.

Exemplary positions of the adjustable connectors



64870AXX



5.5 Connecting the motor and encoder system via an SM./SB. plug connectors

Electric cylinders are supplied with the SM. / SB. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric cylinders with right-angle connector on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round plug connector.

The mating connectors can be ordered separately or together with the motor.

NOTICE



Potential damage to the right-angle connector.

Possible damage to property.

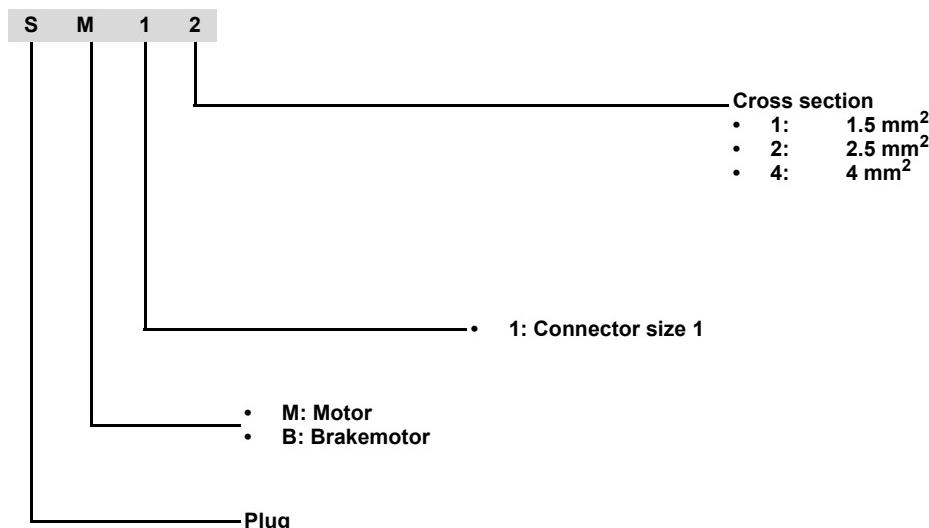
- Do not align the right-angle connector frequently.

All electric motors are equipped with quick-lock right-angle connectors (SpeedTec). If you use connectors without quick lock, the O-ring serves as vibration protector. The connector can only be screwed on until it reaches the O-ring. The connector is always sealed at the bottom.

If you use self-assembled cables with quick lock, you must remove the O-ring.

5.5.1 Plug connector on the cable end

Unit designation of the plug connectors





Electrical Installation

Connecting the motor and encoder system via an SM./SB. plug connectors

Motor cable

| Type | Speed [rpm] | To cable lengths [m] | Cable part no. Fixed installation Stand- alone motor | Cable car- rier instal- lation Stand- alone motor | Core cross section [mm ²] | To cable lengths [m] | Cable part no. Fixed installation Stand- alone motor | Cable car- rier instal- lation Stand- alone motor | Core cross section [mm ²] |
|---------------|----------------|----------------------------|---|--|--|----------------------------|---|--|--|
| CMS50S | 3000 | 100 | 05904544 | 05906245 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS50M | 3000 | 100 | 05904544 | 05906245 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS63S | 3000 | 100 | 05904544 | 05906245 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS63M | 3000 | 90 | 05904544 | 05906245 | 1.5 | 100 | 05904552 | 05906253 | 2.5 |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS71L | 2000 | 100 | 05904544 | 05906245 | 1.5 | | | | |
| | 3000 | | | | | | | | |
| | 4500 | | | | | | | | |

Brakemotor cable

| Type | Speed [rpm] | To cable lengths [m] | Cable part no. Fixed instal- lation Brakemotor | Cable car- rier installa- tion Brakemotor | Core cross section [mm ²] | To cable lengths [m] | Cable part no. Fixed instal- lation Brakemotor | Cable carrier installa- tion Brakemotor | Core cross section [mm ²] |
|---------------|----------------|----------------------------|---|--|--|----------------------------|---|--|--|
| CMS50S | 3000 | 100 | 13354345 | 13354388 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS50M | 3000 | 100 | 13354345 | 13354388 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS63S | 3000 | 100 | 13354345 | 13354388 | 1.5 | | | | |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS63M | 3000 | 90 | 13354345 | 13354388 | 1.5 | 100 | 13354353 | 13354396 | 2.5 |
| | 4500 | | | | | | | | |
| | 6000 | | | | | | | | |
| CMS71L | 2000 | 100 | 13354345 | 13354388 | 1.5 | | | | |
| | 3000 | | | | | | | | |
| | 4500 | | | | | | | | |


Dependence of mating connector on cable diameter and crimping area

| SM1 / SB1 connector type | Crimping area U, V, W, PE [mm ²] | Cable crimping diameter [mm] |
|--------------------------|---|---------------------------------|
| 01986740 | 0.35 - 2.5 | 9 - 14 |
| 01989197 | 0.35 - 2.5 | 14 - 17 |
| 01991639 | 2.5 - 4 | 12 - 17 |

The connector service packs also contain the brake pins, so that no difference needs to be made between motor and brakemotor.

Replaced brakemotor cables

The brake cores of the replaced brakemotor cables are labeled differently from today's standard. This applies to the following cables:

| Cable type | | Connec-tor type | Cable cross section [mm ²] | Prefabricated cables | Part number |
|----------------------------|--------------------------------|-----------------|---|----------------------|-------------|
| Fixed installa-tion | Brakemotor cable ¹⁾ | SB11 | 4 x 1.5 mm ² + 2 x 1 mm ² | 1332 4853 | 0198 6740 |
| | | SB12 | 4 x 2.5 mm ² + 2 x 1 mm ² | 1332 2139 | 0198 6740 |
| | | SB14 | 4 x 4 mm ² + 2 x 1 mm ² | 1332 2147 | 0199 1639 |
| Cable carrier installation | Brakemotor cable ¹⁾ | SB11 | 4 x 1.5 mm ² + 2 x 1 mm ² | 1333 1221 | 0198 9197 |
| | | SB12 | 4 x 2.5 mm ² + 2 x 1 mm ² | 1333 2155 | 0198 9197 |
| | | SB14 | 4 x 4 mm ² + 2 x 1 mm ² | 1333 2163 | 0199 1639 |

1) BP brake: 3-core cable, only 2 cores are used

* The complete connector service pack always includes the following parts:

- Power connector,
- Insulation inserts,
- Socket contacts.

INFORMATION



The current part numbers are derived from the previous part numbers of the DS56 motor. You can continue to use the old numbers, but note the deviating assignment of the contacts C and D.

The polarity of the connection is irrelevant for the BP brake. For the BS brake of the CMS71L, the polarity must be correct.



Electrical Installation

Connecting the motor and encoder system via an SM./SB. plug connectors

5.5.2 Feedback and forced cooling fan cable

Feedback cable

| Cable type | Cable cross section [mm ²] | FI type | Part number | |
|----------------------------|---|------------------------|----------------------|-------------------|
| | | | Prefabricated cables | Signal connector* |
| Fixed installation | 5 x 2 x 0.25 mm ² | MOVIDRIVE® | 0199 4875 | 0198 6732 |
| | | MOVIAXIS® | 1332 7429 | |
| | | MOVIDRIVE® | 0199 3194 | |
| | | MOVIAXIS® | 1332 7437 | |
| Cable carrier installation | 6 x 2 x 0.25 mm ² | MOVIDRIVE® / MOVIAXIS® | 1332 4535 | 0198 6732 |
| | | MOVIDRIVE® / MOVIAXIS® | 1332 4551 | |
| | | | | |
| | | | | |

* The complete connector service pack always includes the following parts:

- Feedback connector,
- Insulation inserts,
- Socket contacts.

Forced cooling fan cables

| Cable type | Cable cross section [mm ²] | Part number |
|----------------------------|---|-------------|
| Fixed installation | 3 x 1 mm ² | 0198 6341 |
| Cable carrier installation | 3 x 1 mm ² | 0199 560X |

5.5.3 Prefabricated cables

Prefabricated cables are available from SEW-EURODRIVE to connect the SM./SB. plug connector system. For information on the prefabricated cables, refer to the "Electric Cylinder" catalog.

The plug connectors are depicted with the connector assignment on the cable at the connection side (back).

Note the following points if you want to assemble the cables yourself:

- The assembly of the signal plug connectors and of the SM. / SB. power plug connectors is described in the following chapters.
- The socket contacts for the motor connection are implemented as crimping contacts. Only use suitable tools for crimping.
- Strip the insulation off the connection leads, page 47. Apply shrink tubing to the connectors.
- Incorrectly installed socket contacts can be removed without removal tools.



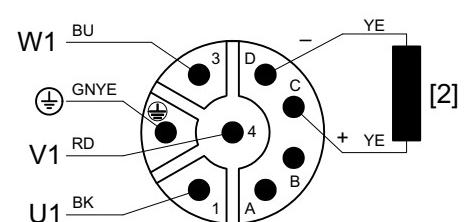
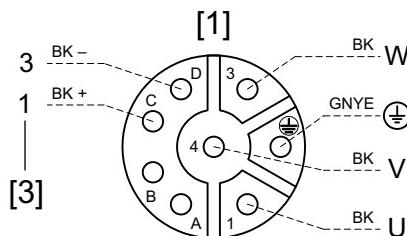
5.5.4 Wiring diagrams

Symbols used

| | |
|--|--|
| | Plug connector upper part (to be connected by the customer) |
| | Plug connector lower part (connected at the factory) |

Connecting SM1 / SB1 power plug connectors

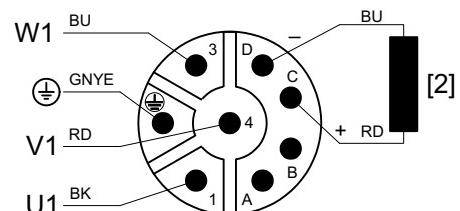
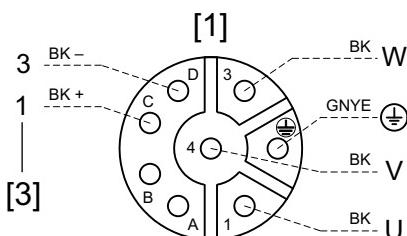
CMS50/63 wiring
diagram with/with-
out BP brake



64623AXX

- [1] BP brake (optional)
- [2] Brake coil
- [3] Motor cable labeling

CMS71 wiring dia-
gram with/without
BS brake



67630AXX

- [1] BS brake (optional)
- [2] Brake coil
- [3] Motor cable labeling

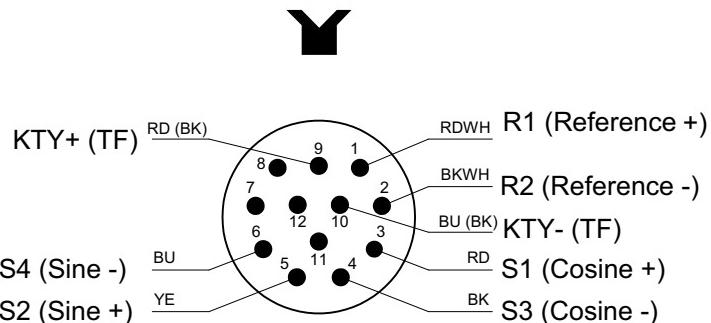
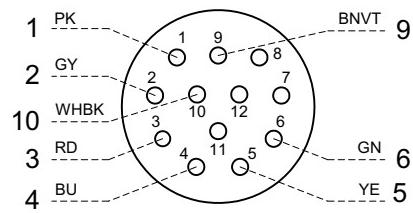


Electrical Installation

Connecting the motor and encoder system via an SM./SB. plug connectors

RH1M resolver signal plug connector

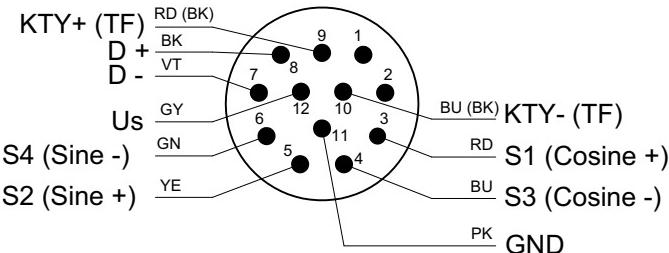
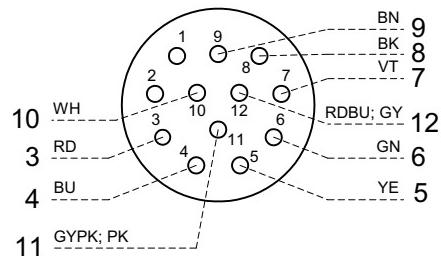
Wiring diagram



64627AXX

ES1H, AS1H, AK0H, EK0H encoder signal plug connector

Wiring diagram



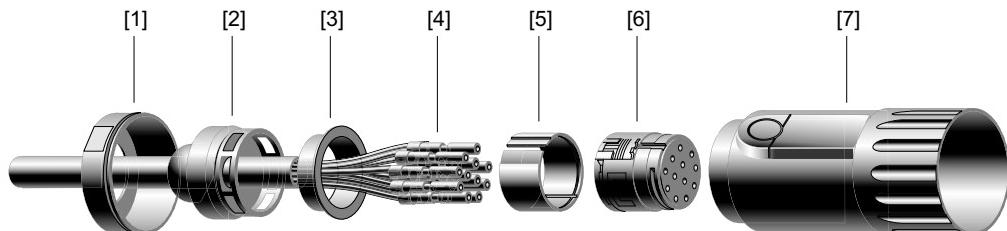
64628AXX



5.6 Assembly of plug connectors for resolver/Hiperface®

5.6.1 Scope of delivery for plug connectors

The following parts are supplied for assembling resolver/HIPERFACE® plug connectors. The SEW part number is 198 673 2.



54715AXX

- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing

INFORMATION



Hold the cable firmly in place when tightening the cable and connector.



Electrical Installation

Assembly of plug connectors for resolver/Hiperface®

5.6.2 Assembly notes for plug connectors

| | | |
|---|--|---|
| 1 | | <ul style="list-style-type: none"> Pull the screw fitting and seal with strain relief 31 mm over the cable. |
| 2 | | <ul style="list-style-type: none"> Strip 28 mm of cable insulation off the end of the cable |
| 3 | | <ul style="list-style-type: none"> Fold back the braided shield and fan it out |
| 4 | | <ul style="list-style-type: none"> Strip 6 mm insulation off the leads Push the socket contacts onto the ends of the leads |
| 5 | | <ul style="list-style-type: none"> Insert the small-diameter positioning tool (SEW part number 019 244 9) into the crimping tool until the green mark appears in the view window [A]. Set the press thickness [B] to 24 on the crimping tool. |
| 6 | | <ul style="list-style-type: none"> Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. Repeat this procedure for each lead. |
| 7 | | <ul style="list-style-type: none"> Pull the shield ring over the leads and press the shield against the seal |



| | | |
|----|--|--|
| 8 | | <ul style="list-style-type: none"> Turn the shield ring until the braided shield is flush with the shield ring. |
| 9 | | <ul style="list-style-type: none"> Pull the insulator apart evenly by about 1 mm. |
| 10 | | <ul style="list-style-type: none"> Insert the socket contacts into the insulator. |
| 11 | | <ul style="list-style-type: none"> Press the insulator together until you hear a "click." |
| 12 | | <ul style="list-style-type: none"> Fold open the insulating sleeve. Position the side of the insulating sleeve with the recess against the groove in the insulator so that the opening of the insulating sleeve is pointing in the same direction as the double-headed arrow on the insulator. Press the insulating sleeve together until it engages. Insert the insulator into the connector housing in the middle position |
| 13 | | <ul style="list-style-type: none"> Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting [A] = Fix in place |

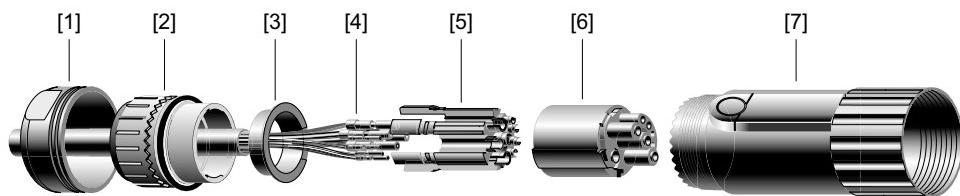


5.7 Power connector assembly

The following assembly figure and description are exemplary for the SM / SB power plug connectors. This description can be used analogously for assembling the SMB and SMC power plug connectors.

5.7.1 Scope of delivery of SM. / SB. power plug connectors

The following parts are supplied for assembling the power plug connectors. The SEW part number is 198 674 0.



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- [1] Screw fitting
- [2] Seal with strain relief
- [3] Shield ring
- [4] Socket contacts
- [5] Insulating sleeve
- [6] Insulator
- [7] Connector housing

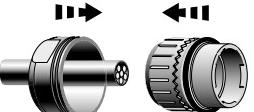
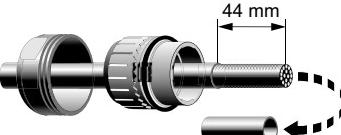
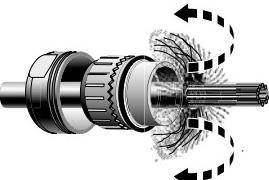
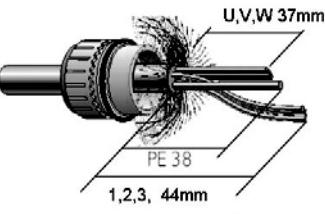
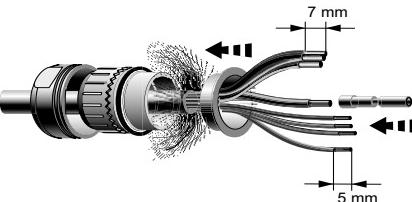
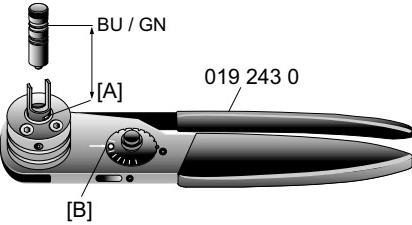
INFORMATION



Hold the cable firmly in place when tightening the cable and the connector.



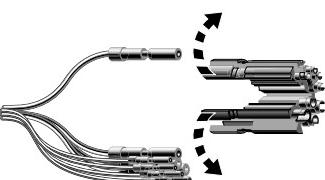
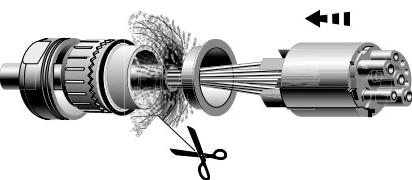
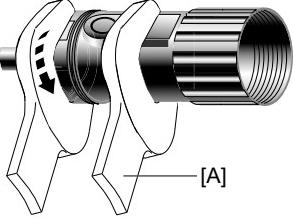
5.7.2 Assembly notes for SM1/SB1 power connectors

| 1 |  | <ul style="list-style-type: none"> Pull the screw fitting and the seal with strain relief over the cable. | | | | | | | | | | | | | | | |
|----------------|---|---|-----------------|---------------------|------------------------------|-----------------|-------------|---------|------------|-----------|------------|----|----------------|------------|-----------|-----------|---|
| 2 |  | <ul style="list-style-type: none"> Strip 44 mm of cable insulation off the end of the cable. | | | | | | | | | | | | | | | |
| 3 |  | <ul style="list-style-type: none"> Fold back the braided shield and fan it out. | | | | | | | | | | | | | | | |
| 4 |  | <ul style="list-style-type: none"> Shorten the power leads (U, V, W) to 37 mm. Shorten the PE lead (GN/YE) to 38 mm. Do not shorten leads 1, 2, 3. | | | | | | | | | | | | | | | |
| 5 |  | <ul style="list-style-type: none"> Pull the shield over the leads. Strip 7 mm of insulation off leads U, V, P and PE. Strip 5 mm of insulation off the leads 1, 2, 3. | | | | | | | | | | | | | | | |
| 6 |  | <ul style="list-style-type: none"> Insert the positioning tool in the crimping tool until the marking (color) appears in the view window [A] appears (see table below). Set the press thickness [B] on the crimping tool according to the table. <table border="1"> <thead> <tr> <th>Litz wire</th> <th>a [mm^2]</th> <th>Positioning tool Part number</th> <th>Marking (color)</th> <th>Press force</th> </tr> </thead> <tbody> <tr> <td>1, 2, 3</td> <td>0.14 - 1.0</td> <td>019 244 9</td> <td>Green (GN)</td> <td>24</td> </tr> <tr> <td>U, V, W and PE</td> <td>0.35 - 4.0</td> <td>019 245 7</td> <td>Blue (BU)</td> <td>6</td> </tr> </tbody> </table> | Litz wire | a [mm^2] | Positioning tool Part number | Marking (color) | Press force | 1, 2, 3 | 0.14 - 1.0 | 019 244 9 | Green (GN) | 24 | U, V, W and PE | 0.35 - 4.0 | 019 245 7 | Blue (BU) | 6 |
| Litz wire | a [mm^2] | Positioning tool Part number | Marking (color) | Press force | | | | | | | | | | | | | |
| 1, 2, 3 | 0.14 - 1.0 | 019 244 9 | Green (GN) | 24 | | | | | | | | | | | | | |
| U, V, W and PE | 0.35 - 4.0 | 019 245 7 | Blue (BU) | 6 | | | | | | | | | | | | | |
| 7 |  | <ul style="list-style-type: none"> Insert a lead with socket contact in the crimping tool and press the tool fully together. The tool then opens automatically. Repeat this procedure for each lead in accordance with the table in step 6. | | | | | | | | | | | | | | | |



Electrical Installation

Power connector assembly

| | | |
|----|---|---|
| 8 |  | <ul style="list-style-type: none"> Open the insulating sleeve. |
| 9 |  | <ul style="list-style-type: none"> Insert the middle socket contact into the insulator according to the wiring diagram on page 37 Close the insulating sleeve until it clicks shut. Insert the remaining socket contacts into the insulator according to the wiring diagram on page 37 |
| 10 |  | <ul style="list-style-type: none"> Shorten the braided shield as shown. Insert the shield ring into the seal so that the shield and end of the cable are flush. Make sure that the braided shield is routed cleanly between the shield ring and the seal. |
| 11 |  | <ul style="list-style-type: none"> Insert the insulator into the connector housing until the seal rests against its stop in the connector housing. |
| 12 |  | <ul style="list-style-type: none"> Use a wrench to hold the connector housing in place and use a second wrench to tighten the screw fitting. [A] = Fix in place |



6 Startup

6.1 Important notes on startup



⚠ WARNING

Danger of electric shock.

Severe or fatal injuries.

- Note the following:

- It is essential to comply with the safety notes in Sec. 2 during installation.
- Switch contacts in utilization category AC-3 to EN 60947-4-1 must be used for switching the motor and the brake.
- When motors are powered by inverters, you must adhere to the wiring instructions issued by the inverter manufacturer.
- It is essential to observe the operating instructions supplied with the servo inverter.



⚠ WARNING

In hoist applications, note that the load torque of the application to be held in place must be less than the holding torque of the brake used.

Severe or fatal injuries.

- Observe the project planning guidelines.
- The spindles that are used are not self-locking.



⚠ WARNING

Series CMS electric cylinders may not execute any safety functions without master safety systems.

Severe or fatal injuries.

- Use master safety systems to ensure that equipment and personnel are protected.



⚠ WARNING

Incorrect use, installation or operation represents a crushing hazard due to the vertical movement of the spindle.

Severe or fatal injuries.

- Take measures to prevent inadvertent contact.



⚠ CAUTION

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.



Startup

Before startup

NOTICE



The rated speed (n_N) of the motor can be higher than the mechanically permitted speed (n_{epk}).

Possible damage to property.

- Limit the maximum speed at the servo inverter. For information on the procedure, refer to the documentation of the servo inverter.

NOTICE



With the electric cylinders CMS50M, 63M and 71L, the maximum limit torque (M_{pk}) and the maximum current (I_{max}) may not be exceeded, not even for acceleration.

Possible damage to property.

- Limit the maximum current at the servo inverter.

6.2 Before startup

- The drive must be undamaged and not blocked.
- All connections must be established correctly.
- All protective covers have to be fitted correctly.
- All motor protection devices must be active.
- There must not be any other sources of danger.
- No heat-sensitive or insulating materials are allowed to cover the motor surface.



7 Inspection and Maintenance

⚠ WARNING



Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.

⚠ CAUTION



The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.

NOTICE



Improper inspection/maintenance may result in damages to the electric cylinder.

Possible damage to property.

- Note the following information.
- Strictly observe the safety notes in the individual chapters.
- Components may be subject to mechanical loads. Before removing the electric cylinder, ensure that the structure provided by the customer is supported and secured.
- Before starting work, isolate the electric cylinder and brake from the power supply. Secure the electric cylinder against unintended power-up.
- Use only genuine spare parts in accordance with the valid parts list.

7.1 General maintenance work

The electric cylinder is maintenance-free except for the threaded spindles. Replace defective parts if possible.

Remove any traces of dirt, chips, dust, etc. from the bellows (only CMS71L) with a soft cloth.

Note that mobile cables are subject to wear. They have to be checked for external changes on a regular basis.



7.2 Lubrication of screw drive

There may be a loss of lubricant between the nut and spindle in threaded spindles. Lubricants also decrease in quality and effectiveness with age and wear. This means lubrication is required at regular intervals.

Lubrication for screw drives has to be specified accurately in terms of type, quantity and relubrication intervals. These factors depend on:

- Load
- Velocity
- Cyclic duration factor
- Type of screw drive (recirculating ball screw or planetary roller screw drive)
- Ambient temperature
- Degree of pollution caused by dust, humidity, etc.

INFORMATION



The following information is intended as recommendations only. It is not intended to replace individual project planning for every application.

Permanent relubrication (for example via connection to lubrication system) is basically the preferred solution over lubrication at certain intervals.

Relubrication at intervals is not recommended for planetary roller screws, which can require about 2.5 times more lubricant than recirculating ball screws.



7.2.1 General information

INFORMATION

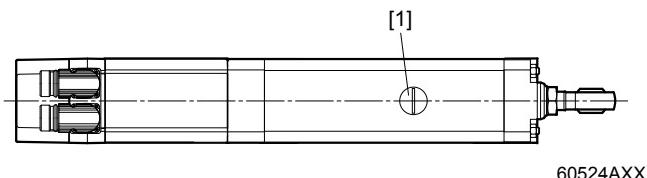


The lubricating grease discharged into the electric cylinder accumulates inside the drive. Used lubricant must be removed from the inside of the motor after five years at the latest.

Service work must be performed by SEW employees only. During service work, the spindle must be removed from the unit and the old lubricant removed from the spindle's surface.

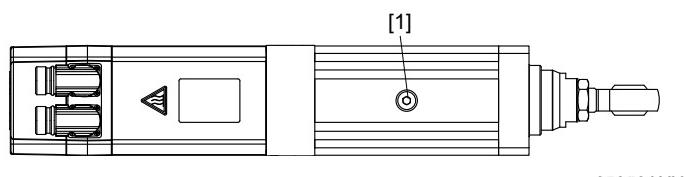
7.2.2 Size CMS50S/M

A taper greasing nipple DIN71412 [1] for manual relubrication with a grease gun is installed as standard on the spindle nut in the inside of the motor. The greasing nipple is accessible via screw plugs [1]. In order to reach it, slowly move the drive until the greasing position is visible.



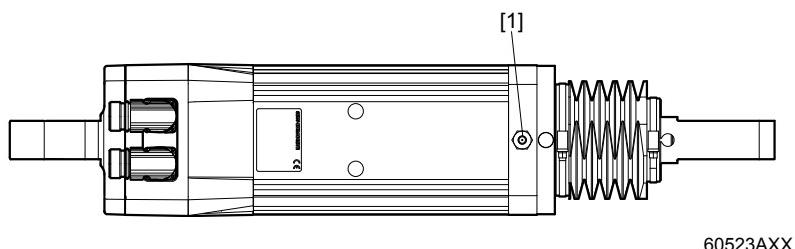
7.2.3 Size CMS63S/M

CMS63 motors are equipped with oil bath lubrication that requires very little maintenance. Oil level check, filling and draining via screw plug [1].



7.2.4 Size CMS71L/M

A taper greasing nipple DIN 71412 [1] for manual relubrication with a grease gun is installed as standard on the motor.





7.3 CMS50/CMS71 ball screws and planetary roller screw drives – Lubricant

CMS electric cylinders are filled at the plant with the lubricant Fuchs RENOLIT CX-TOM15 as standard. This lubricant is used for recirculating ball screws and planetary roller screws.

Instead, you can order the CMS50 motor with food-grade lubricant OBEEN FS 2 from Castrol.

INFORMATION



Only relubricate electric cylinders with the following lubricant:
Fuchs RENOLIT CX-TOM15

The lubricating grease Renolit CX-TOM15 of the company Fuchs can be ordered from SEW in a 400 g cartridge (DIN1284) under **part no. 03207196**.



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The cartridge is suitable for grease guns in line with DIN1283 with adapter piece for DIN71412 grease nipples



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7.4 Relubrication interval

NOTICE



Improper relubrication may result in damages to the electric cylinder.

Possible damage to property.

- Note the following:

- **The relubrication intervals must be determined individually depending on the load and cycle times. The following information applies only to the application examples described.**
- The drive must generally be relubricated once a year.
- The following information only applies to the application examples described.
- Always use the appropriate amount of lubricant for the individual application.
- If insufficient lubricant is applied, the lubricant film is disrupted and the service life thereby reduced.
- Excessive lubrication increases friction and results in heat generation.
- When relubricating the drive, always pay attention to cleanliness.
- There should be no dirt in the lubricant.
- Wipe the greasing nipple with a cloth before applying the grease gun.
- Make sure there is no trapped air in the lubricant or lubricant supply lines.

7.4.1 CMS50S with ball screw (KGT):

Example

CMS50S, 5 mm/spindle pitch revolution

- 0.15 m travel distance
- Mean traveling velocity 0.15 m/s
- 1300 N load

Relubrication

Relubrication quantity 1 cm³

- after a travel distance of 200 km
- or
- 20 million revolutions of the threaded spindle nut



7.4.2 CMS71L with ball screw (KGT):

Example CMS71L, 10 mm/spindle pitch revolution

- 0.2 m travel distance
- Mean traveling velocity 0.2 m/s
- 4000 N load

continuous relubrication $0.8 \text{ cm}^3/100 \text{ km} = 0.008 \text{ cm}^3/1 \text{ km}$

Relubrication intervals Relubrication quantity 2 cm^3

- After a travel distance of 250 km
- or
- 25 million revolutions of the threaded spindle nut

7.4.3 CMS71L with planetary roller screw drive (PGT):

Example CMS71L, 5 mm/spindle pitch revolution

- 0.2 m travel distance
- Mean traveling velocity 0.2 m/s
- 4000 N load

continuous relubrication $2 \text{ cm}^3/100 \text{ km} = 0.02 \text{ cm}^3/1 \text{ km}$

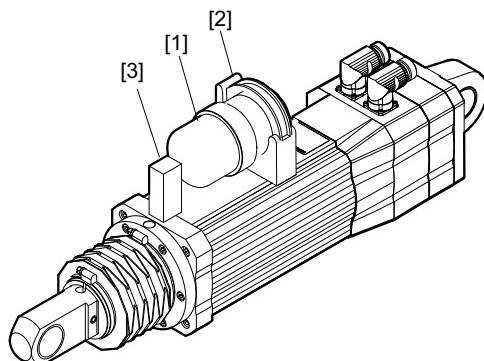


7.5 Lubricator – only for size CMS71L

On request, CMS71L electric cylinders can be equipped with a lubricator. The threaded spindle nut is relubricated continuously with this option.

The lubricator comprises a drive unit with an electric motor, which is supplied with power either with a set of batteries (Vario lubrication system) or with 24 V and function monitoring (Control time/impulse lubrication system). This motor drains the lubricant container [1] via a piston. The Control lubrication system is connected to a customer control device via a cable (length 5 m, included in the scope of delivery).

The threaded elbow joints [3] are mounted, filled with lubricant and vented at the production plant.



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- [1] Lubricant container
- [2] Retaining clip
- [3] Threaded elbow joint

INFORMATION



The time between lubrifications is set to one year at the production plant and is sufficient for normal applications.

For cases with high annual operating time, e.g. 24 operating hours per day or an operational performance of > 20 km/day, consult SEW-EURODRIVE.



7.5.1 Lubricator variants

Star Vario (SV)

The Star Vario lubricator is powered by batteries, independent of the operating state of the electric cylinder. When the electric cylinder is started up, the Star Vario lubricator must be activated separately. Activate the lubricator by turning the rotary switch to the **ON** position. After activation, the lubricator **continuously** supplies the set lubricant quantity.

Star Vario divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 60 cm³** over a **period of 12 months**.

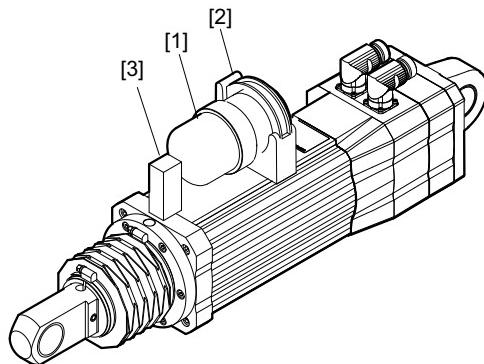
Star Control Time (ST)

The Star Control Time lubricator is connected to the voltage supply or controller via cable. The lubricator **continuously** supplies the set lubricant quantity when the **supply voltage (24 V) is connected**. The status (function, fill level) of the lubricator can be monitored via the controller.

Star Control Time divides the content of the lubricant container into several smaller dispensing cycles within the operating period. The factory setting of the lubricator is to dispense a **volume of 0.69 cm³** over a **period of 100 operating hours**.

Star Control Impulse (SI)

The Star Control Impulse lubricator is connected to the voltage supply or controller via cable. The lubricator dispenses the set lubricant quantity **in one amount** when the **supply voltage (24 V) is connected**. To dispense another amount of lubricant, the **voltage must be interrupted and connected again**. The status (function, fill level) of the lubricator can be monitored via the controller. The factory setting of the lubricator is to dispense a **volume of 0.26 cm³** per impulse.



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- [1] Lubricant container
- [2] Retaining clip
- [3] Threaded elbow joint

7.5.2 Wearing parts can be ordered from Perma

The lubricant container [1] and the battery set (only for Vario) are wearing parts and must be replaced after a year.

The parts can be ordered directly from Perma using the following part numbers:

| Designation | Part no. |
|---|--------------|
| Star lubricant container LC unit S60 Renolit CX-TOM15 | 16.01085.385 |
| Battery set (Vario) | 21.000.000 |
| Cable, 5 m (Control) | 26.004.001 |

These parts cannot be ordered directly from SEW-EURODRIVE.

7.5.3 Retrofit set from SEW-EURODRIVE

Complete lubrication systems can be ordered from SEW-EURODRIVE for retrofitting. The retrofit set consists of parts [1, 2] with the following part numbers:

| Designation | Part no. |
|---|------------|
| Retrofit set lubricator cpl. Vario (SV) | 1333 281 3 |
| Retrofit set lubricator cpl. Control Time (ST) | 1333 319 4 |
| Retrofit set lubricator cpl. Control Impulse (SI) | 1652 097 1 |

In addition, the following threaded elbow joint 1333 3178 [3] has to be ordered from SEW-EURODRIVE as it is **not included in the retrofit set**.

INFORMATION



When retrofitting, you must vent the threaded elbow joint [3].



7.6 Installation and startup of Star Vario/Star Control lubricators

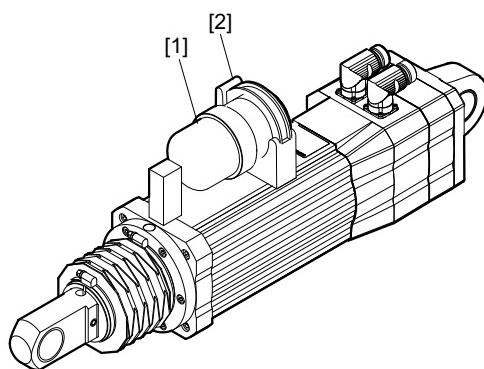
7.6.1 Assembly kit for lubricator

Assembly kit for lubricator

- Star Vario (SV) cpl. SEW part number 13332813
- Star Control Time (ST) cpl. SEW part number 13333194
- Star Control Impulse (SI) cpl. SEW part number 16520971

consists of the following individual components:

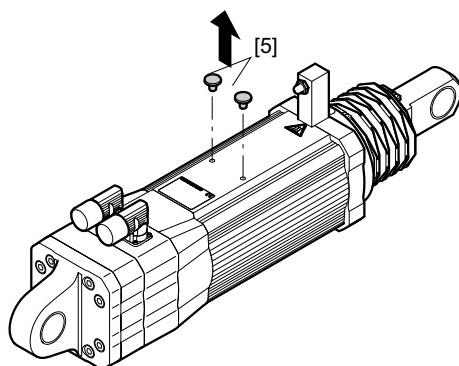
- 1 x Star Vario lubricator [1]
- or Star Control lubricator [1]
- 1 x clamp [2]
- 2 x machine screw M6x16



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7.6.2 Assembly procedure

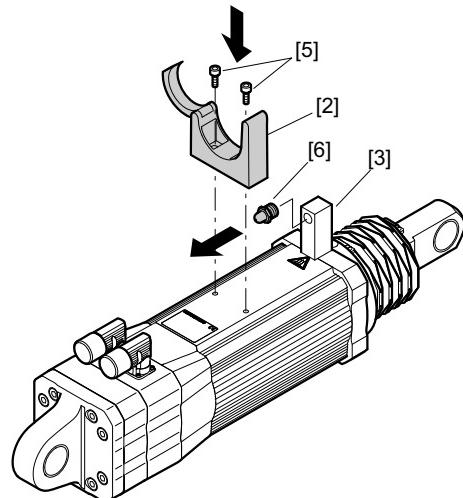
1. Remove the closing plug [5] from the motor housing.



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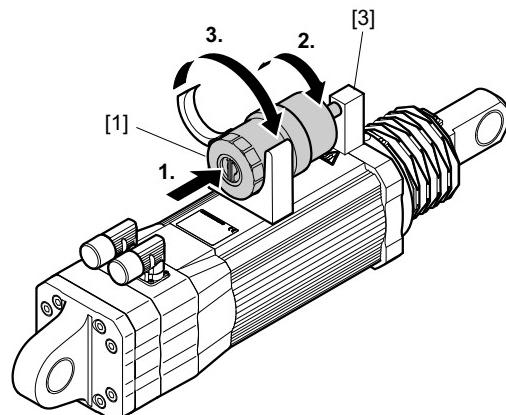


2. Mount the clamp [2] to the motor housing using 2 M6 machine screws [5]. Remove the greasing nipple [6] from the attached threaded elbow joint [3] and remove the closing plug from the lubricator.



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3. Place the lubricator [1] into the clamp and twist the lubricator into the threaded elbow joint [3]. Tighten the lubricator manually.



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4. Close the clamp by locking the top clamp arm into place.
5. For Star Control, connect the cables to the voltage supply and the controller.



7.6.3 Retrofitting the lubricator

This requires the threaded elbow joint [3] (SEW part number: 13333178), see following figure.

INFORMATION



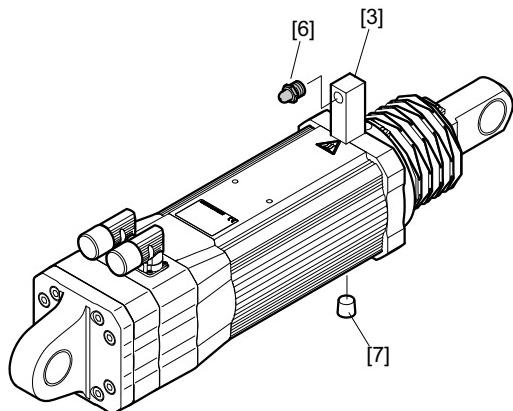
The threaded elbow joint is not included in the assembly kit and must be ordered from SEW-EURODRIVE separately.

Air pockets in the lubrication system

INFORMATION



Air trapped in the lubrication system could lead to an inadequate supply of lubricant to the spindles. The system must be vented according to the steps described below.



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1. Mount the threaded elbow angle [3], tighten it manually and insert the greasing nipple [6].
2. Release the screw plug [7] and remove it.
3. Press enough grease into the threaded elbow joint [3] until the grease escaping from the screw plug bore [7] has no bubbles.
4. Turn the screw plug [7] back in and tighten it.
5. For more information on assembly, see the assembly procedure on page 64.



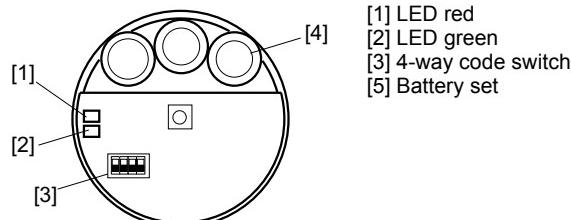
7.6.4 Lubricator – startup

Star Vario (SV)

The code switches of the Star Vario variant are factory set to a dispensing time of 12 months or a dispensing volume of 60 cm^3 , which is sufficient for standard applications.

When the electric cylinder is started up, the Star Vario lubricator must be activated. Activate the lubricator by turning the rotary switch to the **ON** position.

Status indication



| LED | Signal | Signal intervals | Operating state |
|---------------|----------|------------------|-------------------|
| Green | flashing | Every 15 seconds | Operation (OK) |
| Red | flashing | Every 8 seconds | Error/malfunction |
| Green and red | flashing | Every 3 seconds | LC unit empty |
| Red | flashing | Constant | Vario dispensing |

| | 12 months (SEW factory setting) | 6 months | 3 months | 1 month |
|---------------------------|---------------------------------|----------------------|----------------------|----------------------|
| Runtime setting coding | Time Volume | Time Volume | Time Volume | Time Volume |
| Dispensing volume per day | 0.17 cm^3 | 0.33 cm^3 | 0.67 cm^3 | 2.0 cm^3 |



Inspection and Maintenance

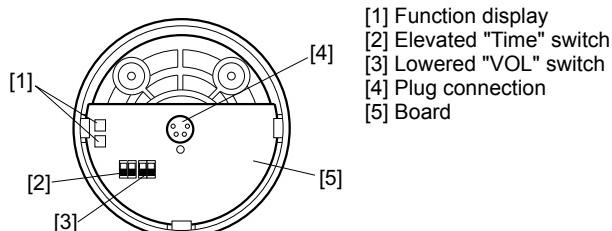
Installation and startup of Star Vario/Star Control lubricators

Star Control Time (ST)

The code switches of the Star Control Time variant are set to a dispensing quantity of 0.69 cm^3 for every 100 operating hours or a dispensing volume of 60 cm^3 .

The Star Control Time variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status indication



| LED | Signal | Description |
|----------------------|--|-------------------------|
| Green | Constant signal | OK = System functioning |
| Red | Constant signal < 30 s with motor start-up | Dispensing action |
| Red | Constant signal > 30 s | Error/malfunction |
| Green and red | Constant signal | LC unit empty, replace |

| | (SEW factory setting) | | | |
|--|-----------------------|----------------------|----------------------|----------------------|
| Runtime setting coding | Time Volume | Time Volume | Time Volume | Time Volume |
| Dispensing quantity for every 100 operating hours | 0.69 cm^3 | 1.39 cm^3 | 2.78 cm^3 | 8.33 cm^3 |

INFORMATION



As soon as the voltage ($15 - 25 \text{ V}_{\text{DC}}$, max. 30 V_{DC}) is present, the lubricator dispenses the set volume in determined time intervals. The voltage must be present for at least 2 minutes to ensure the correct operating time.

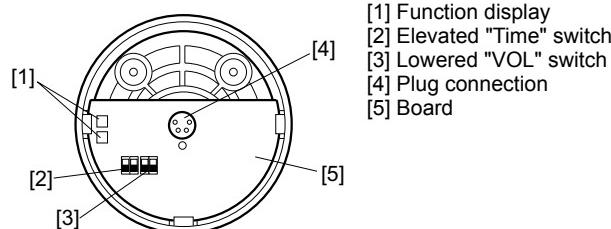


Star Control Impulse (SI)

The code switches of the Star Control Impulse variant are set to a dispensing quantity of 0.53 cm^3 per impulse or a dispensing volume of 60 cm^3 .

The Star Control Impulse variant is directly connected to the voltage supply and controller that control the lubricator in motor operation. Thus, a manual activation is not necessary.

Status indication



| LED | Signal | Description |
|---------------|--|-------------------------|
| Green | Constant signal | OK = System functioning |
| Red | Constant signal < 30 s with motor start-up | Dispensing action |
| Red | Constant signal > 30 s | Error/malfunction |
| Green and red | Constant signal | LC unit empty, replace |

| | (SEW factory setting) | | | | | |
|-------------------------------|-----------------------|--------------------|--------------------|--------------------|-------|--------|
| Runtime setting coding | 1 | 2 | 3 | 4 | 1 | 2 |
| Dispensing volume per impulse | 0.26 cm^3 | 0.53 cm^3 | 1.06 cm^3 | 2.11 cm^3 | Time | Volume |

INFORMATION



As soon as the voltage ($15 - 25 \text{ V}_{\text{DC}}$, max. 30 V_{DC}) is present, the lubricator dispenses the set volume once. The voltage must be present long enough for the dispensing process to be completed (max 2 minutes).

INFORMATION



The voltage supply must be interrupted for at least 15 seconds and re-connected for each dispensing process.



7.7 Oil bath lubrication of CMS63

CMS63 motors are equipped with oil bath lubrication that requires little maintenance. Regular visual checks for leakages is all that is required for maintenance. The oil need not be changed in usual applications.

Changing the oil might be useful in applications with increased requirements, such as

- Travel cycles with a cyclic duration factor > 60% and an operational performance of > 1 km/hour.
- Working strokes < 10 mm with stroke frequencies > 5 Hz
- Expected service life > 10000 hours of nominal operation.

Please contact SEW-EURODRIVE in such cases.

CMS63 electric cylinders are filled at the plant with the lubricant Mobil SHC630 as standard. This lubricant is used for recirculating ball screws and planetary roller screws.

Instead, you can order the CMS63 motor with food-grade lubricant OPTIMOL OPTILEB GT from Castrol.



7.8 Size CMS63 with oil lubrication

The sealing system and the components of these drives have been developed and tested to complement each other. Observe the following notes in order not to reduce the service life:

- Do not paint the piston rod
- Do not expose the piston rod to potential damage resulting from hard components
- Make sure that the joints are free to move
- Visually check for any leakages regularly, at least every other week
- Oil change every 5 years or after 10,000 hours of operation

7.8.1 Replacement interval of wearing parts

The drive reaches the end of its service life after 10,000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

| Replacement intervals of the components | |
|---|---------------|
| Threaded spindle | Not necessary |
| A- and B-end bearing | Not necessary |
| Sealing | Not necessary |

7.8.2 Maintenance intervals

Every 2 weeks

- Visually check for leakage.

Every 5 years

- Change the oil.

| Lubricating oil | Mobil SHC 630 (standard) Castrol Optileb GT 220 (food-grade oil) | | | |
|--------------------|---|-----|-----|-----|
| | 100 | 200 | 400 | 600 |
| Stroke length [mm] | KGT | 220 | 450 | 900 |
| Amount of oil [ml] | PGT | 260 | 520 | - |



7.8.3 Removing and reinserting the oil screw plug

NOTICE



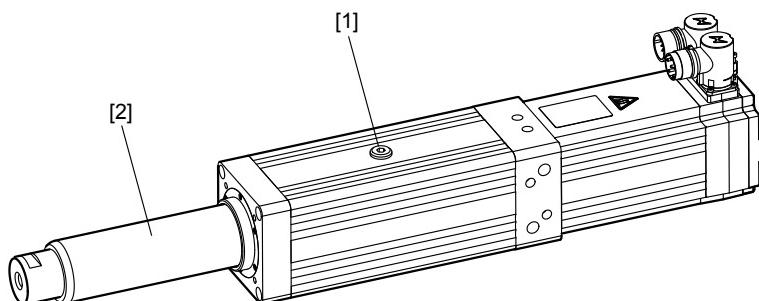
Removing and reinserting the oil screw plug [1] of the electric cylinder incorrectly can damage the unit.

Possible damage to property.

- Note the following:

- Remove the oil screw plug slowly; it might be under pressure depending on the position of the piston rod.
- We recommend to remove the screw plug with the piston rod [2] extended as this position bears the lowest pressure.
- Do only reinsert the oil screw plug [1] (20 Nm tightening torque) with the piston rod **extended**.

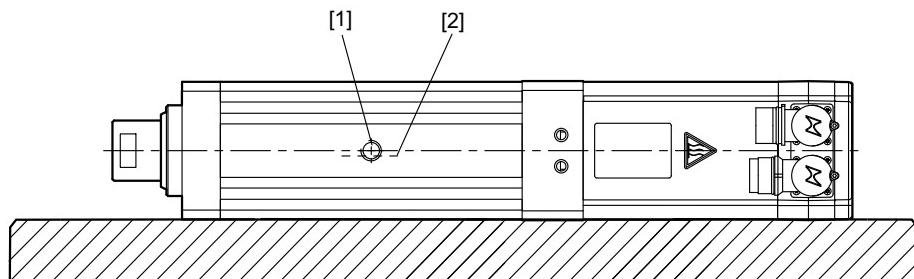
Thus, you make sure that there is no negative pressure inside the motor. The sealing system has not been designed for negative pressure. It will become leaky if positive and negative pressure constantly alternate!



65766AXX

7.8.4 Checking the oil level

1. Position the motor with the oil screw plug pointing upwards.
2. Remove the oil screw plug [1] as described in the previous chapter.
3. Completely retract the piston rod.
4. Position the electric cylinder horizontally as illustrated below.
5. Place a container underneath the oil drain plug [1].
6. Slowly remove the oil screw plug [1]. Small amounts of oil may leak out as the permitted max. oil level is higher than the lower edge of the oil level bore.
7. The correct oil level [2] is in line with the oil screw plug [1].



65767AXX



8. If the oil level is too low, do the following:
 - Fill in additional oil of the same type via the oil screw plug [1] until the oil level is at the lower edge of the oil level bore.
9. Screw the oil screw plug [1] back in.

7.8.5 Oil change

Read the following notes before you begin to change the oil.

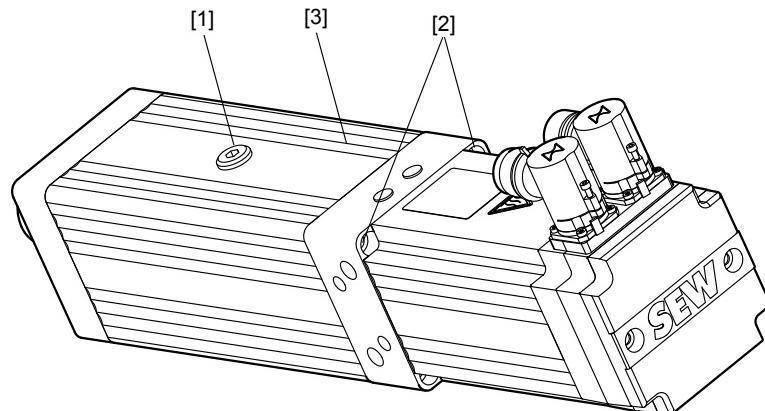
INFORMATION



Prevent foreign bodies from entering into the motor during the following work. Provide for a clean working environment.

Draining the oil

1. Extend the piston rod.
2. Open the oil screw plug [1].
3. Loosen the 4 retaining screws [2] of the built-on housing [3].



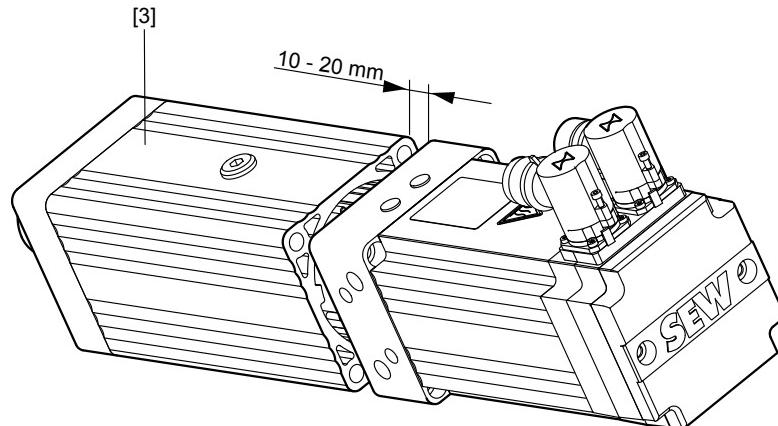
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4. Place the electric cylinder horizontally on a oil-drainage container.
5. Remove the 4 retaining screws [2] of the built-on housing [3].



Inspection and Maintenance Size CMS63 with oil lubrication

- Carefully pull the built-on housing [3] from the rest of the motor until there is a gap of 10 - 20 mm.



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- Completely drain the oil. Position the piston rod 20 - 60 mm higher, if necessary, so that the oil drains off faster from the piston rod and the spindle nut.

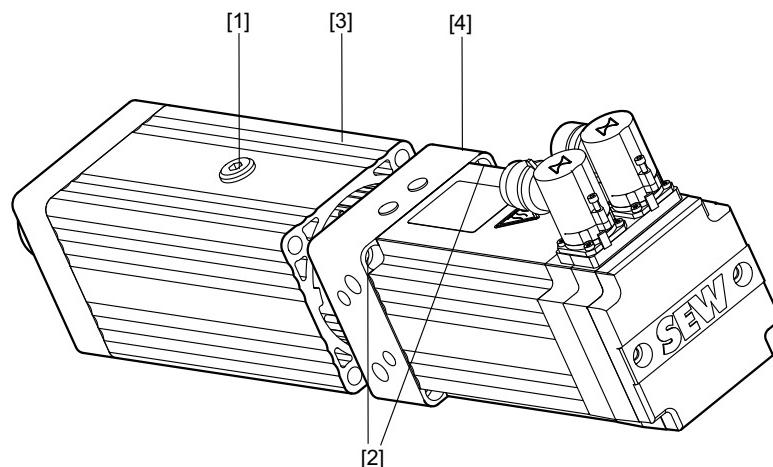
INFORMATION



Any dripping oil must be removed immediately with an oil binding agent.

Filling in the oil

- Clean the sealing surface between the built-on housing [3] and the motor [4] using a soft, lint-free cloth.
- Push the built-on housing [3] and the motor [4] back together.



65770AXX



3. Screw the built-on housing [3] and the motor [4] together with 4 retaining screws [2] (tightening torque 10 Nm).
4. Fill in new oil of the same grade via the oil screw plug [1]. You must not mix different lubricants.
 - Fill in the amount of oil specified on the nameplate through the opening for the oil screw plug [1].
 - Check the oil level. Observe the notes on page 72.

INFORMATION



Any dripping oil must be removed immediately with an oil binding agent.

-
5. Reinsert the oil screw plug [1]. Observe the notes on page 72.

7.9 Sizes CMS50 and CMS71 with grease lubrication

7.9.1 Replacement interval of wearing parts

The drive reaches the end of its service life after 10,000 hours of nominal operation. A general overhaul and refit of the drive is not recommended.

| Replacement intervals of the components | |
|---|---|
| Threaded spindle | Not necessary |
| A- and B-end bearing | Not necessary |
| Oil seals | After half of the service life (5000 hours) ¹⁾ |
| Plain bearing bush | provided by the customer ¹⁾ |
| Bellows | After half of the service life (5000 hours) ¹⁾ |

1) For CMS71L only



8 Malfunctions



⚠ WARNING

Risk of crushing if the drive starts up unintentionally.

Severe or fatal injuries.

- De-energize the motor before you start working on the unit.
- Secure the motor against unintended power-up.



⚠ CAUTION

The electric cylinder can get very hot during operation.

Danger of burns.

- Never touch the electric cylinder during operation or in the cool down phase once it has been switched off.



NOTICE

Improper troubleshooting may result in damages to the electric cylinder.

Possible damage to property.

- Note the following information.
- Components may be subject to mechanical loads. Support and secure the customer structure before removing the electric cylinder.
- Use only genuine spare parts in accordance with the valid parts list.
- Strictly observe the safety notes in the individual chapters.

8.1 Customer service

Please have the following information available if you require customer service assistance:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- A digital photograph if possible



8.2 Malfunctions of the electric cylinder

| Error | Possible cause | Remedy |
|--|---|---|
| Electric cylinder does not start | Supply cable interrupted | Check connections, correct if necessary |
| | Fuse has blown | Replace fuse |
| | Motor protection has triggered | Check motor protection for correct setting, correct error if necessary |
| | Servo inverter faulty, overloaded, incorrectly wired or incorrectly set | Check servo inverter, check wiring |
| Incorrect direction of rotation | Electric cylinder connected incorrectly | Check servo inverter, check setpoints |
| Electric cylinder hums and has high current consumption | Drive is blocked | Check drive |
| | Brake does not release | → Section "Brake problems" |
| | Encoder cable malfunction | Check encoder cable |
| Electric cylinder heats up excessively (measure temperature) | Overload | Measure power, use larger motor or reduce load if necessary |
| | Insufficient cooling | Correct cooling air supply or clear cooling air passages, retrofit forced cooling fan if necessary |
| | Ambient temperature too high | Comply with permitted temperature range |
| | Nominal operation type (S1 to S10, DIN 57530) exceeded, e.g. through excessive starting frequency | Adjust the rated operating mode of the motor to the required operating conditions; consult a professional to determine the correct drive if necessary |
| Running noise on motor | Bearing damage | Contact SEW-EURODRIVE customer service |



Malfunctions

Malfunctions of the servo inverter

8.3 Malfunctions of the servo inverter

INFORMATION



The malfunctions described on page section 8.2 can occur when the electric cylinder is operated with a servo inverter. Refer to the servo inverter operating instructions for the meaning of the problems that occur and to find information about rectifying the problems.

Please have the following information to hand if you require the assistance of our customer service:

- Complete nameplate data
- Type and extent of the problem
- Time the problem occurred and any accompanying circumstances
- Assumed cause
- Digital photo if possible

8.4 Brake errors

| Error | Possible cause | Remedy |
|------------------------|---|--|
| Brake does not release | Incorrect operating voltage on the brake | <ul style="list-style-type: none"> • Apply correct voltage • Reversed polarity, only for BS2 brake |
| | Max. permitted working air gap exceeded because brake lining worn down. | Contact SEW-EURODRIVE customer service |
| | Voltage drop along supply cable > 10% | Ensure correct connection voltage; check cable cross section |
| | Brake coil has interturn short circuit or a short circuit to frame | Contact SEW-EURODRIVE customer service |
| Motor does not brake | Brake lining worn | Contact SEW-EURODRIVE customer service |
| | Incorrect braking torque. | Contact SEW-EURODRIVE customer service |
| Brake worn | Brake release times incorrect | Adjust brake release times to startup and deceleration processes |

8.5 Disposal

This product consists of:

- Iron
- Aluminum
- Copper
- Plastics
- Electronic components

Dispose of all components in accordance with applicable regulations.

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

9 Technical Data

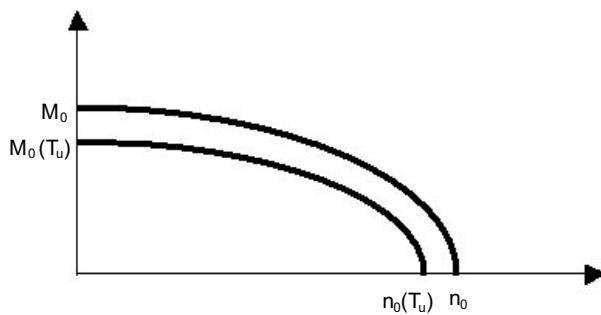
9.1 Rated data

This data is indicated on the nameplate of the motor. In accordance with IEC34 (EN 60034), the nameplate data apply to a maximum ambient temperature of 40 °C and a maximum altitude of 1000 m above sea level. Please contact SEW-EURODRIVE for installation altitudes above 1000 m.

9.2 Derating for increased ambient temperature

The following derating applies for project planning of CMS electric cylinders in the ambient temperature range from + 40°C to + 60°C:

The thermal speed/limit torque characteristic curve is re-scaled towards the origin (minimized). The thermal operating point based on effective torque and thermally effective speed of the application must be below the re-scaled characteristic curve.



$$M_0(T_u) = M_0 \times \left(\sqrt{\frac{145^\circ\text{C} - T_u}{105^\circ\text{C}}} \right)$$

$$n_0(T_u) = K_e \times n_0 \times \left(\sqrt{\frac{145^\circ\text{C} - T_u}{105^\circ\text{C}}} \right)$$

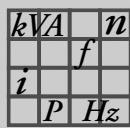
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| | |
|------------|---|
| T_A | Ambient temperature °C |
| M_0 | Static torque under nominal conditions |
| $M_0(T_A)$ | Standstill torque at increased temperatures $40^\circ\text{C} < T_A < 60^\circ\text{C}$ |
| n_0 | Thermal limit speed under nominal conditions |
| $n_0(T_A)$ | Thermal limit speed at increased temperatures $40^\circ\text{C} < T_A < 60^\circ\text{C}$ |
| K_e | Encoder factor for resolver = 1; for electronic encoder (e.g. Hiperface encoder) = 0.9 |

INFORMATION



CMS servomotors are designed for a maximum ambient temperature of 40 °C as standard. Please contact SEW-EURODRIVE if the motors are used at higher ambient temperatures.



Technical Data Key to the data tables

9.3 Key to the data tables

The following table lists the short symbols used in the "Technical Data" tables.

| | |
|---------------|---|
| n_N | Rated speed |
| n_{epk} | Maximum mechanically permitted speed |
| M_0 | Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm) |
| M_{0VR} | Standstill torque (thermal continuous torque at a speed of 5 to 50 rpm) with forced cooling fan |
| I_0 | Standstill current |
| I_{0VR} | Standstill current with forced cooling fan |
| M_{pk} | Maximum limit torque |
| I_{max} | maximum current |
| J_{mot} | Mass moment of inertia without brake ¹⁾ |
| J_{bmot} | Mass moment of inertia with brake ¹⁾ |
| J_{zusatz} | Additional mass moment of inertia without brake ²⁾ |
| $J_{bzusatz}$ | Additional mass moment of inertia with brake ²⁾ |
| M_B | Braking torque |
| L_1 | Inductance between connection phase and star point |
| R_1 | Resistance between connection phase and star point |
| U_{p0kalt} | Internal voltage at 1000 rpm |
| P | Spindle pitch |
| D | Nominal spindle diameter |
| F | Maximum permanent feed force |
| F_{VR} | Maximum permanent feed force with forced cooling fan |
| F_{pk} | Peak feed force ³⁾ |
| m | Weight, variant without brake |
| m_{VR} | Weight, variant without brake, with forced cooling fan |
| m_{bmot} | Weight, variant with brake |
| m_{bmotVR} | Weight, variant with brake and forced cooling fan |

- 1) for the complete motor and spindle
- 2) For project planning with the SEW Workbench
- 3) Depending on max. amplifier current, dynamic or static load of spindle; please contact SEW-EURODRIVE prior to project planning with maximum force.

9.4 General features

| Type | |
|---|-----------------------|
| Thermal class | F (155 °C) |
| Ambient temperature | -20 °C to +40 °C |
| Noise levels / EN 60034 | Below specified value |
| Vibration class | "B" to EN60034-14 |
| Positioning accuracy (repetition accuracy) at constant force and temperature | ±0.05 mm |

9.5 CMS50

9.5.1 Features

The table below shows the features.

| Type | Standard | Optional |
|----------------------|--|-----------------------|
| Degree of protection | IP65 | |
| Motor protection | KTY | |
| Mounting position | Any | |
| Cooling | Natural convection | VR forced cooling fan |
| Lubrication | Via housing bore, with taper greasing nipple DIN 71412-A | Food grade lubricant |
| Spindle protection | Smooth piston rod with sealing system | |

9.5.2 Technical data

INFORMATION



Stroke length 300 mm → $n_{epk} = 2500$ rpm (max. mechanical speed)
 Stroke lengths 70 and 150 mm → $n_{epk} = 4500$ rpm (max. mechanical speed)

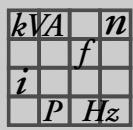
The following tables show the technical data.

CMS50S

| Spindle | n_N | Stroke length | M_0 | I_0 | M_{pk} | I_{max} | J_{mot} | J_{bmot} | J_{zusatz} $J_{bzusatz}$ | M_B | L_1 | R_1 | U_{p0kalt} | F | F_{pk} | m | m_{bmot} |
|-------------|-------|---------------|-------|-------|----------|-----------|----------------------|------------|-------------------------------|-------|-------|-------|--------------|------|----------|------|------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 15x5 | 3000 | 70 | 1.3 | 0.96 | 5.2 | 5.1 | 0.54 | 0.6 | 0.12 | 4.3 | 71 | 22.49 | 86 | 1.2 | 5.3 | 5.8 | 6.4 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 6.5 | 7.1 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 7.8 | 8.4 |
| | 4500 | 70 | 1.3 | 1.32 | 5.2 | 7.0 | 0.54 | 0.6 | 0.12 | 4.3 | 37 | 11.61 | 62 | 1.2 | 5.3 | 5.8 | 6.4 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 6.5 | 7.1 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 7.8 | 8.4 |
| | 6000 | 70 | 1.3 | 1.7 | 5.2 | 9.0 | 0.54 | 0.6 | 0.12 | 4.3 | 22.5 | 7.11 | 48.5 | 1.2 | 5.3 | 5.8 | 6.4 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 6.5 | 7.1 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 7.8 | 8.4 |

CMS50S with forced cooling fan VR

| Spindle | n_N | Stroke length | M_{0VR} | I_{0VR} | M_{pk} | I_{max} | J_{mot} | J_{bmot} | J_{zusatz} $J_{bzusatz}$ | M_B | L_1 | R_1 | U_{p0kalt} | F_{VR} | F_{pk} | m_{VR} | m_{bmotVR} |
|-------------|-------|---------------|-----------|-----------|----------|-----------|----------------------|------------|-------------------------------|-------|-------|-------|--------------|----------|----------|----------|--------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 15x5 | 3000 | 70 | 1.7 | 1.25 | 5.2 | 5.1 | 0.54 | 0.6 | 0.12 | 4.3 | 71 | 22.49 | 86 | 1.5 | 5.3 | 6.4 | 7.0 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 7.1 | 7.7 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 8.4 | 9.0 |
| | 4500 | 70 | 1.7 | 1.7 | 5.2 | 7.0 | 0.54 | 0.6 | 0.12 | 4.3 | 37 | 11.61 | 62 | 1.5 | 5.3 | 6.4 | 7.0 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 7.1 | 7.7 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 8.4 | 9.0 |
| | 6000 | 70 | 1.7 | 2.2 | 5.2 | 9.0 | 0.54 | 0.6 | 0.12 | 4.3 | 22.5 | 7.11 | 48.5 | 1.5 | 5.3 | 6.4 | 7.0 |
| | | 150 | | | | | 0.56 | 0.62 | 0.14 | | | | | | | 7.1 | 7.7 |
| | | 300 | | | | | 0.61 | 0.67 | 0.19 | | | | | | | 8.4 | 9.0 |



Technical Data CMS50

CMS50M

INFORMATION



Torque limitation is required.

| Spindle | n _N | Stroke length | M ₀ | I ₀ | M _{pk} | I _{max} | J _{mot} | J _{bmot} | J _{zusatz} J _{bzusatz} | M _B | L ₁ | R ₁ | U _{p0kalt} | F | F _{pk} | m | m _{bmot} |
|-------------|----------------|---------------|----------------|----------------|---|---|----------------------|-------------------|---|----------------|----------------|----------------|---------------------|------|-----------------|------|-------------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 15x5 | 3000 | 70 | 2.4 | 1.68 | 5.2 ¹⁾ (10.3) ²⁾ | 3.6 ³⁾ (9.6) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 38.5 | 9.96 | 90 | 2.2 | 5.3 | 6.8 | 7.4 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 7.5 | 8.1 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 8.8 | 9.4 |
| | 4500 | 70 | 2.4 | 2.3 | 5.2 ¹⁾ (10.3) ²⁾ | 5.0 ³⁾ (13.1) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 20.5 | 5.28 | 66 | 2.2 | 5.3 | 6.8 | 7.4 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 7.5 | 8.1 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 8.8 | 9.4 |
| | 6000 | 70 | 2.4 | 3.0 | 5.2 ¹⁾ (10.3) ²⁾ | 6.5 ³⁾ (17.1) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 12.0 | 3.21 | 50.5 | 2.2 | 5.3 | 6.8 | 7.4 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 7.5 | 8.1 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 8.8 | 9.4 |

- 1) Maximum permitted torque
- 2) Standard values of motor
- 3) Maximum permitted current

CMS50M with forced cooling fan VR

INFORMATION



Torque limitation is required.

| Spindle | n _N | Stroke length | M _{0VR} | I _{0VR} | M _{pk} | I _{max} | J _{mot} | J _{bmot} | J _{zusatz} J _{bzusatz} | M _B | L ₁ | R ₁ | U _{p0kalt} | F _{VR} | F _{pk} | m _{VR} | m _{bmotVR} |
|-------------|----------------|---------------|------------------|------------------|---|---|----------------------|-------------------|---|----------------|----------------|----------------|---------------------|-----------------|-----------------|-----------------|---------------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 15x5 | 3000 | 70 | 2.8 | 2.0 | 5.2 ¹⁾ (10.3) ²⁾ | 3.6 ³⁾ (9.6) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 38.5 | 9.96 | 90 | 2.5 | 5.3 | 7.4 | 8.0 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 8.1 | 8.7 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 9.4 | 10.0 |
| | 4500 | 70 | 2.8 | 2.7 | 5.2 ¹⁾ (10.3) ²⁾ | 5.0 ³⁾ (13.1) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 20.5 | 5.28 | 66 | 2.5 | 5.3 | 7.4 | 8.0 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 8.1 | 8.7 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 9.4 | 10.0 |
| | 6000 | 70 | 2.8 | 3.5 | 5.2 ¹⁾ (10.3) ²⁾ | 6.5 ³⁾ (17.1) ²⁾ | 0.79 | 0.85 | 0.12 | 4.3 | 12.0 | 3.21 | 50.5 | 2.5 | 5.3 | 7.4 | 8.0 |
| | | 150 | | | | | 0.81 | 0.87 | 0.14 | | | | | | | 8.1 | 8.7 |
| | | 300 | | | | | 0.86 | 0.92 | 0.19 | | | | | | | 9.4 | 10.0 |

- 1) Maximum permitted torque
- 2) Standard values of motor
- 3) Maximum permitted current

9.6 CMS63

9.6.1 Features

The table below shows the features.

| Type | Standard | Optional |
|----------------------|---------------------------------------|-----------------------|
| Degree of protection | IP65 | |
| Motor protection | KTY | |
| Mounting position | M1/M2, see section 3.6 | M0 |
| Cooling | Natural convection/water cooling | VR forced cooling fan |
| Lubrication | Oil bath lubrication | Food grade lubricant |
| Spindle protection | Smooth piston rod with sealing system | |

9.6.2 Technical data

INFORMATION

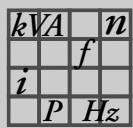


Stroke lengths 100, 200, 400 and 600 mm → $n_{epk} = 4500$ rpm (max. mechanical speed)

The following tables show the technical data.

CMS63S

| Spindle | n_N | Stroke length | M_0 | I_0 | M_{pk} | I_{max} | J_{mot} | J_{bmot} | J_{zusatz} $J_{bzusatz}$ | M_B | L_1 | R_1 | U_{p0kalt} | F | F_{pk} | m | m_{bmot} |
|-------------|-------|---------------|-------|-------|----------|-----------|-------------------|------------|-------------------------------|-------|-------|----------|--------------|------|----------|-----|------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | $[\text{kgcm}^2]$ | | | [Nm] | [mH] | [\Omega] | [V] | [kN] | | | |
| KGT 25x6 | 3000 | 100 | 2.9 | 2.15 | 11.1 | 12.9 | 1.92 | 2.26 | 0.77 | 9.3 | 36.5 | 6.79 | 90 | 2.4 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 2.24 | 2.58 | 1.09 | | | | | | | 11 | 12 |
| | | 400 | | | | | 2.64 | 2.98 | 1.49 | | | | | | | 15 | 16 |
| | | 600 | | | | | 3.1 | 3.44 | 1.95 | | | | | | | 18 | 19 |
| PGT 20x5 | 4500 | 100 | 2.9 | 3.05 | 11.1 | 18.3 | 1.92 | 2.26 | 0.77 | 9.3 | 18.3 | 3.34 | 64 | 2.4 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 2.24 | 2.58 | 1.09 | | | | | | | 11 | 12 |
| | | 400 | | | | | 2.64 | 2.98 | 1.49 | | | | | | | 15 | 16 |
| | | 600 | | | | | 3.1 | 3.44 | 1.95 | | | | | | | 18 | 19 |
| | 6000 | 100 | 2.9 | 3.9 | 11.1 | 23.4 | 1.92 | 2.26 | 0.77 | 9.3 | 11.2 | 2.1 | 50 | 2.4 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 2.24 | 2.58 | 1.09 | | | | | | | 11 | 12 |
| | | 400 | | | | | 2.64 | 2.98 | 1.49 | | | | | | | 15 | 16 |
| | | 600 | | | | | 3.1 | 3.44 | 1.95 | | | | | | | 18 | 19 |
| | 3000 | 100 | 2.9 | 2.15 | 11.1 | 12.9 | 1.69 | 2.03 | 0.54 | 9.3 | 36.5 | 6.79 | 90 | 2.8 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 1.81 | 2.15 | 0.66 | | | | | | | 11 | 12 |
| | 4500 | 100 | 2.9 | 3.05 | 11.1 | 18.3 | 1.69 | 2.03 | 0.54 | 9.3 | 18.3 | 3.34 | 64 | 2.8 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 1.81 | 2.15 | 0.66 | | | | | | | 11 | 12 |
| | 6000 | 100 | 2.9 | 3.9 | 11.1 | 23.4 | 1.69 | 2.03 | 0.54 | 9.3 | 11.2 | 2.1 | 50 | 2.8 | 10 | 9.5 | 10.5 |
| | | 200 | | | | | 1.81 | 2.15 | 0.66 | | | | | | | 11 | 12 |

**CMS63M****INFORMATION****Torque limitation is required.**

| Spindle | n _N | Stroke length | M ₀ | I ₀ | M _{pk} | I _{max} | J _{mot} | J _{bmot} | J _{zusatz} | J _{bzusatz} | M _B | L ₁ | R ₁ | U _{p0kalt} | F | F _{pk} | m | m _{bmot} |
|-------------|----------------|---------------|----------------|----------------|--|--|----------------------|-------------------|---------------------|----------------------|----------------|----------------|----------------|---------------------|------|-----------------|------|-------------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 25x6 | 3000 | 100 | 5.3 | 3.6 | 11.1 ¹⁾ (21.4) ²⁾ | 7.9 ³⁾ (21.6) ²⁾ | 2.69 | 3.03 | 0.77 | 9.3 | 22 | 3.56 | 100 | 4.1 | 10 | 11 | 12 | |
| | | 200 | | | | | 3.01 | 3.35 | 1.09 | | | | | | | 12.5 | 13.5 | |
| | | 400 | | | | | 3.41 | 3.75 | 1.49 | | | | | | | 16.5 | 17.5 | |
| | | 600 | | | | | 3.87 | 4.21 | 1.95 | | | | | | | 19.5 | 20.5 | |
| | 4500 | 100 | 5.3 | 5.4 | 11.1 ¹⁾ (21.4) ²⁾ | 11.9 ³⁾ (32.4) ²⁾ | 2.69 | 3.03 | 0.77 | 9.3 | 9.8 | 1.48 | 67 | 4.1 | 10 | 11 | 12 | |
| | | 200 | | | | | 3.01 | 3.35 | 1.09 | | | | | | | 12.5 | 13.5 | |
| | | 400 | | | | | 3.41 | 3.75 | 1.49 | | | | | | | 16.5 | 17.5 | |
| | | 600 | | | | | 3.87 | 4.21 | 1.95 | | | | | | | 19.5 | 20.5 | |
| PGT 20x5 | 6000 | 100 | 5.3 | 6.9 | 11.1 ¹⁾ (21.4) ²⁾ | 15.2 ³⁾ (41.4) ²⁾ | 2.69 | 3.03 | 0.77 | 9.3 | 5.9 | 0.92 | 52 | 4.1 | 10 | 11 | 12 | |
| | | 200 | | | | | 3.01 | 3.35 | 1.09 | | | | | | | 12.5 | 13.5 | |
| | | 400 | | | | | 3.41 | 3.75 | 1.49 | | | | | | | 16.5 | 17.5 | |
| | | 600 | | | | | 3.87 | 4.21 | 1.95 | | | | | | | 19.5 | 20.5 | |
| | 3000 | 100 | 5.3 | 3.6 | 11.1 ¹⁾ (21.4) ²⁾ | 7.9 ³⁾ (21.6) ²⁾ | 2.46 | 2.8 | 0.54 | 9.3 | 22 | 3.56 | 100 | 5.2 | 10 | 11 | 12 | |
| | | 200 | | | | | 2.58 | 2.92 | 0.66 | | | | | | | 12.5 | 13.5 | |
| | 4500 | 100 | 5.3 | 5.4 | 11.1 ¹⁾ (21.4) ²⁾ | 11.9 ³⁾ (32.4) ²⁾ | 2.46 | 2.8 | 0.54 | 9.3 | 9.8 | 1.48 | 67 | 5.2 | 10 | 11 | 12 | |
| | | 200 | | | | | 2.58 | 2.92 | 0.66 | | | | | | | 12.5 | 13.5 | |
| | 6000 | 100 | 5.3 | 6.9 | 11.1 ¹⁾ (21.4) ²⁾ | 15.2 ³⁾ (41.4) ²⁾ | 2.46 | 2.8 | 0.54 | 9.3 | 5.9 | 0.92 | 52 | 5.2 | 10 | 11 | 12 | |
| | | 200 | | | | | 2.58 | 2.92 | 0.66 | | | | | | | 12.5 | 13.5 | |

1) Max. permitted torque

2) Standard values of motor

3) Max. permitted current

9.7 CMS71

9.7.1 Features

The table below shows the features.

| Type | Standard | Optional |
|----------------------|---|-------------------------|
| Degree of protection | IP45 (IP65) ¹⁾ | |
| Motor protection | TF | KTY/TH |
| Mounting position | Any | |
| Cooling | Natural convection | |
| Lubrication | Fixed lubrication point with taper greasing nipple DIN 71412-A | Lubricator, chapter 7.6 |
| Spindle protection | Bellows | |

1) for electrical components

9.7.2 Technical data

The following tables show the technical data.

INFORMATION



Stroke length 200 mm → $n_{epk} = 3000$ rpm (max. mechanical speed)
Stroke length 350 mm → $n_{epk} = 2000$ rpm (max. mechanical speed)

INFORMATION



Torque limitation is required.

| Spindle | n_N | Stroke length | M_0 | I_0 | M_{pk} | I_{max} | J_{mot} | J_{bmot} | J_{zusatz} | $J_{bzusatz}$ | M_B | L_1 | R_1 | U_{p0kalt} | F | F_{pk} | m | m_{bmot} |
|-----------|-------|---------------|-------|-------|--|--|----------------------|------------|--------------|---------------|-------|-------|-------|--------------|------|------------------|------|------------|
| DxP | [rpm] | [mm] | [Nm] | [A] | [Nm] | [A] | [kgcm ²] | | | | [Nm] | [mH] | [Ω] | [V] | [kN] | | [kg] | |
| KGT 32x6 | 2000 | 200 | 9.5 | 4.2 | 22.1 ¹⁾ (31.4) ²⁾ | 9.2 ³⁾ (16.8) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 24 | 2.5 | 151 | 6.7 | 20 | 19 | 20 |
| | | 350 | 9.5 | 4.2 | 16.6 ¹⁾ (31.4) ²⁾ | 7.3 ³⁾ (16.8) ²⁾ | 45.3 | 50.3 | 36.1 | 39.4 | 19 | 24 | 2.5 | 151 | 6.7 | 15 ⁴⁾ | 25 | 26 |
| | 3000 | 200 | 9.5 | 6.2 | 22.1 ¹⁾ (31.4) ²⁾ | 13.6 ³⁾ (25) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 11 | 1.12 | 102 | 6.7 | 20 | 19 | 20 |
| | | 350 | 9.5 | 6.2 | 16.6 ¹⁾ (31.4) ²⁾ | 10.8 ³⁾ (25) ²⁾ | 45.3 | 50.3 | 36.1 | 39.4 | 19 | 11 | 1.12 | 102 | 6.7 | 15 ⁴⁾ | 25 | 26 |
| | 4500 | 200 | 9.5 | 9.6 | 22.1 ¹⁾ (31.4) ²⁾ | 21.1 ³⁾ (38) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 4.5 | 0.5 | 65 | 6.7 | 20 | 19 | 20 |
| | | 350 | 9.5 | 9.6 | 16.6 ¹⁾ (31.4) ²⁾ | 16.8 ³⁾ (38) ²⁾ | 45.3 | 50.3 | 36.1 | 39.4 | 19 | 4.5 | 0.5 | 65 | 6.7 | 15 ⁴⁾ | 25 | 26 |
| KGT 32x10 | 2000 | 200 | 9.5 | 4.2 | 31.4 | 16.8 | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 24 | 2.5 | 151 | 3.6 | 17 | 19 | 20 |
| | 3000 | 200 | 9.5 | 6.2 | 31.4 | 25 | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 11 | 1.12 | 102 | 3.6 | 17 | 19 | 20 |
| | 4500 | 200 | 9.5 | 9.6 | 31.4 | 38 | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 4.5 | 0.5 | 65 | 3.6 | 17 | 19 | 20 |
| PGT 24x5 | 2000 | 200 | 9.5 | 4.2 | 24.4 ¹⁾ (31.4) ²⁾ | 10.5 ³⁾ (16.8) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 24 | 2.5 | 151 | 7.2 | 20 | 19 | 20 |
| | 3000 | 200 | 9.5 | 6.2 | 24.4 ¹⁾ (31.4) ²⁾ | 15.5 ³⁾ (25) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 11 | 1.12 | 102 | 7.2 | 20 | 19 | 20 |
| | 4500 | 200 | 9.5 | 9.6 | 24.4 ¹⁾ (31.4) ²⁾ | 24 ³⁾ (38) ²⁾ | 32.5 | 37.5 | 23.3 | 26.6 | 19 | 4.5 | 0.5 | 65 | 7.2 | 20 | 19 | 20 |

1) Max. permitted torque

2) Standard values of motor

3) Max. permitted current

4) In case of tensile loads, a peak feed force F_{pk} of 20 kN is possible

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

Brake

9.8 Brake

The standard voltage supply of the brakes is DC 24 V and they operate with a constant braking torque. The brakes cannot be retrofitted and operate without brake rectifier or brake control unit. Observe the maximum currents of the brakes when connecting them. Overvoltage protection must be implemented by the customer, for example using varistors.

The brake can be used at all speeds.

The brake is released electrically. The brake is applied when the voltage is switched off.

NOTICE



The BS brake of CMS71L will not function if the polarity is incorrect.

Possible damage to property.

- Make sure the polarity is correct.

INFORMATION



Comply with the applicable regulations issued by the relevant employer's liability insurance association regarding phase failure protection and the associated circuit/circuit modification!

INFORMATION



In view of the DC voltage to be switched and the high level of current load, it is essential to use either special brake contactors or AC contactors with contacts in utilization category AC-3 according to EN 60947-4-1.

The mechanical brake is not used as service brake but as emergency brake or holding brake for general machine standstill.

Observe the notes in the relevant operating instructions for servo inverters concerning the switching sequence of motor enable and brake control during standard operation.

9.9 BP/BS brakes

The following table shows the technical data of the brakes.

| Motor type | Brake type | V_N [V _{DC}] | R [Ω] | I [A] | P [W] | M_B [Nm] | t_1 [10 ⁻³ s] | t_2 [10 ⁻³ s] |
|------------|------------|-----------------------------|----------|----------|----------|---------------|-------------------------------|-------------------------------|
| CMS50S | BP04 | 24 | 56.5 | 0.42 | 10.2 | 4.3 | 60 | 15 |
| CMS50M | | | 35 | 0.67 | 16 | 9.3 | 60 | 15 |
| CMS63S | | | 34 | 0.71 | 17 | 19 | 120 | 120 |
| CMS63M | BP09 | | | | | | | |
| CMS71L | BS2 | | | | | | | |

M_B = Braking torque

P = Power consumption of the coil

t_1 = Response time

t_2 = Application time

I = Operating current 20 °C

R = Coil resistance

V_N = Nominal voltage

INFORMATION



The response and application times of the brakes in the above tables do not take account of customer installations.

| <i>kVA</i> | <i>n</i> |
|------------|-----------|
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

BMV brake control system

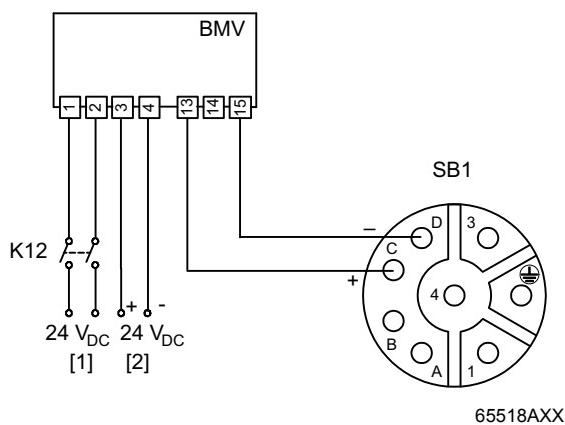
9.10 BMV brake control system

The brakes for CMS electric cylinders can be controlled via the BMV brake relay as an option.

In every application, the BP holding brake can be controlled via the BMV brake relay or a customer relay with varistor overvoltage protection.

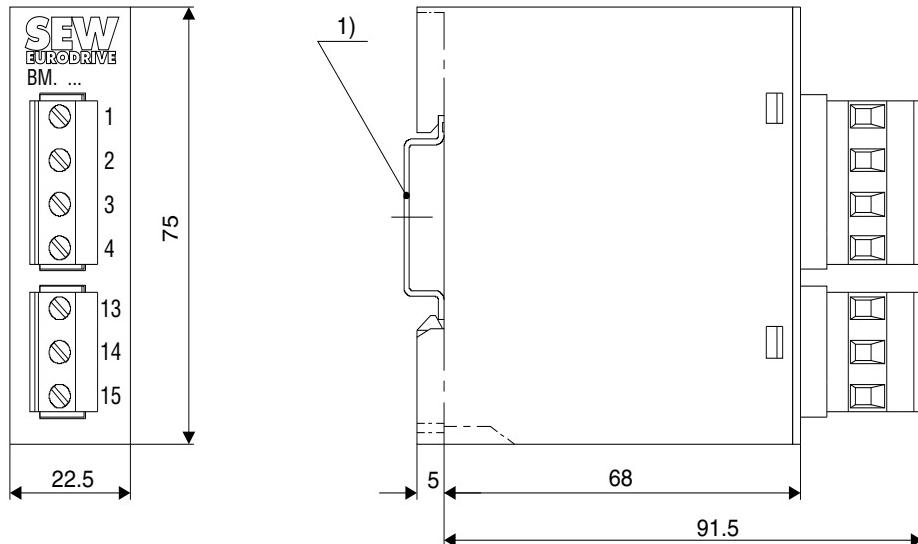
If the system complies with the specifications for direct brake control, a BP brake can also be controlled directly via the brake output of a MOVIAXIS® servo inverter.

BMV brake control system



- [1] External 24 V voltage supply for the brake
- [2] Servo inverter brake output

Dimension drawing



- [1] Support rail mounting EN 50022-35-7.5

9.11 Encoder systems

The following encoder systems are used for electric cylinders:

9.11.1 Resolver

| | |
|---------------------------------|--------------------------|
| Part number for RH1M | 0199 031 4 |
| Number of poles | 2 |
| Primary | Rotor |
| Input voltage | 7 V |
| Input frequency | 7 kHz |
| Gear ratio ± 10 % | 0.5 |
| Phase shift ± 5° | +13° |
| Input impedance ± 15 % | 130 + j120 Ω |
| Output impedance ± 15 % | 200 + j270 Ω |
| Input resistance ± 10 % | 82 Ω |
| Output resistance ± 10 % | 68 Ω |
| Maximum electrical error | ± 6' |
| Temperature range | -55 °C to +150 °C |

9.11.2 Hiperface® encoder

/ES1H, /AS1H, /AK0H

SEW-EURODRIVE offers Hiperface® encoders as an alternative to the resolver.

| Type | ES1H | AS1H | AK0H | | |
|-------------------------------------|---|-----------------------------------|---|--|--|
| CMS50S/M and CMS63S/M | 1335 496 5 | 1335 495 7 | 1335 661 5 | | |
| CMS71L | 1332 860 3 | 1332 858 1 | | | |
| Supply voltage | DC 7 - 8 - 12 V polarity reversal protected | | | | |
| Max. current consumption | 140 mA | | | | |
| Maximum operating frequency | 200 kHz | | | | |
| Pulses (sine cycles) per revolution | 1024 | | | | |
| Output amplitude per track | 0.9 - 1.1 V _{pp} sin/cos | 0.8 - 1.1 V _{pp} sin/cos | | | |
| Single-turn resolution | 32768 increments/revolution (15 bit) | | | | |
| Multi-turn resolution | - | 4096 revolutions (12 bits) | | | |
| Transmission protocol | Hiperface® | | | | |
| Serial data output | Driver according to EIA RS-485 | | | | |
| Vibration resistance (10-2000 Hz) | ≤ 200 m/s ² (DIN IEC 68-2-6) | | ≤ 100 m/s ² (DIN IEC 68-2-6) | | |
| Maximum speed | 12000 min ⁻¹ | | 9000 rpm | | |
| Connection | 12-pin round connector | | | | |
| Temperature range | -20 °C to +110 °C | | | | |

| | | |
|------------|----------|-----------|
| <i>kVA</i> | <i>f</i> | <i>n</i> |
| <i>i</i> | <i>P</i> | <i>Hz</i> |

9.12 Switching and protection devices of the motor series

9.12.1 Protective measures

The electric cylinders must be protected against both overloads and short circuits.

Install the motors with sufficient space for air to cool them.

The surface temperature can exceed 100 °C during operation in accordance with thermal classification F. Therefore, measures must be taken to prevent inadvertent contact.

The motors are equipped with temperature detection to protect the motor winding against overheating.

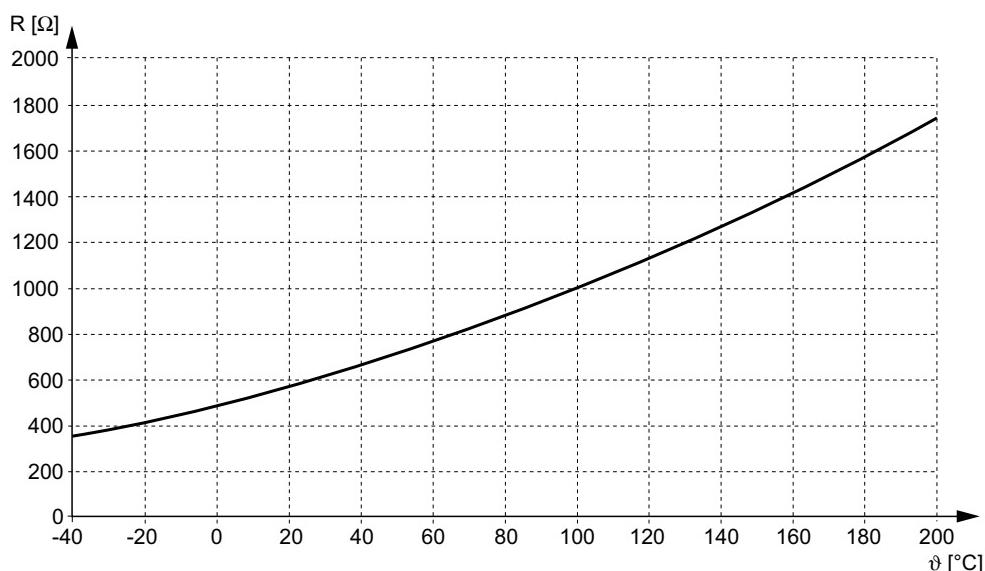
Temperature sensor KTY CMS50/63/71

The temperature is measured by KTY 84-130 temperature sensors installed as standard. The correct motor model must be activated in the servo inverter to enable thermal motor protection (I^2t , effective current monitoring). For information on the procedure, refer to the documentation of the servo inverter.

Observe the following points:

- It is essential to observe the correct connection of the KTY to ensure correct evaluation of the temperature sensor.
- Avoid currents > 4 mA in the circuit of the KTY since high self-heating of the temperature sensor can damage its insulation and the motor winding.

The characteristic curve in the following figure shows the resistance curve with a measuring current of 2 mA.



50927AXX

**TF temperature sensor (optional CMS71L)**

The PTC thermistors comply with DIN 44082.

Resistance measurement (measuring instrument with $V \leq 2.5$ V or $I < 1$ mA):

- Standard measured values: $20\ldots500\ \Omega$, thermal resistance $> 4000\ \Omega$

TF bimetallic switch (optional CMS71L)

The thermostats are connected in series and open when the permitted winding temperature is exceeded.

| TH data | AC | DC | |
|----------------------------------|-----------------------|----------|----------|
| Max. voltage | AC 60 V ¹⁾ | DC 60 V | DC 24 V |
| Current ($\cos \varphi = 1.0$) | AC 2.5 A | DC 1.0 A | DC 1.6 A |
| Current ($\cos \varphi = 0.6$) | AC 1.6 A | | |

1) AC 250 V is permitted for the variant with terminal box

9.12.2 EMC measures

SEW-EURODRIVE synchronous servomotors are components for installation in machinery and systems. The designer of the machine or system is responsible for complying with the EMC Directive 89/336/EEC.

Routing brake cables

Brake and power cables may only be routed together if either the brake cable or the power cable is shielded. We recommend that you use prefabricated cables.

Notes on encoder connection

Observe the following instructions when connecting an encoder:

- Use a shielded cable with twisted pair conductors only.
- Connect the shield to the PE potential on both ends over a large surface area.

Thermal motor protection

The cables can only be routed together if either the KTY cable or the power cable is shielded. We recommend that you use prefabricated cables.

| | |
|------------|----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |

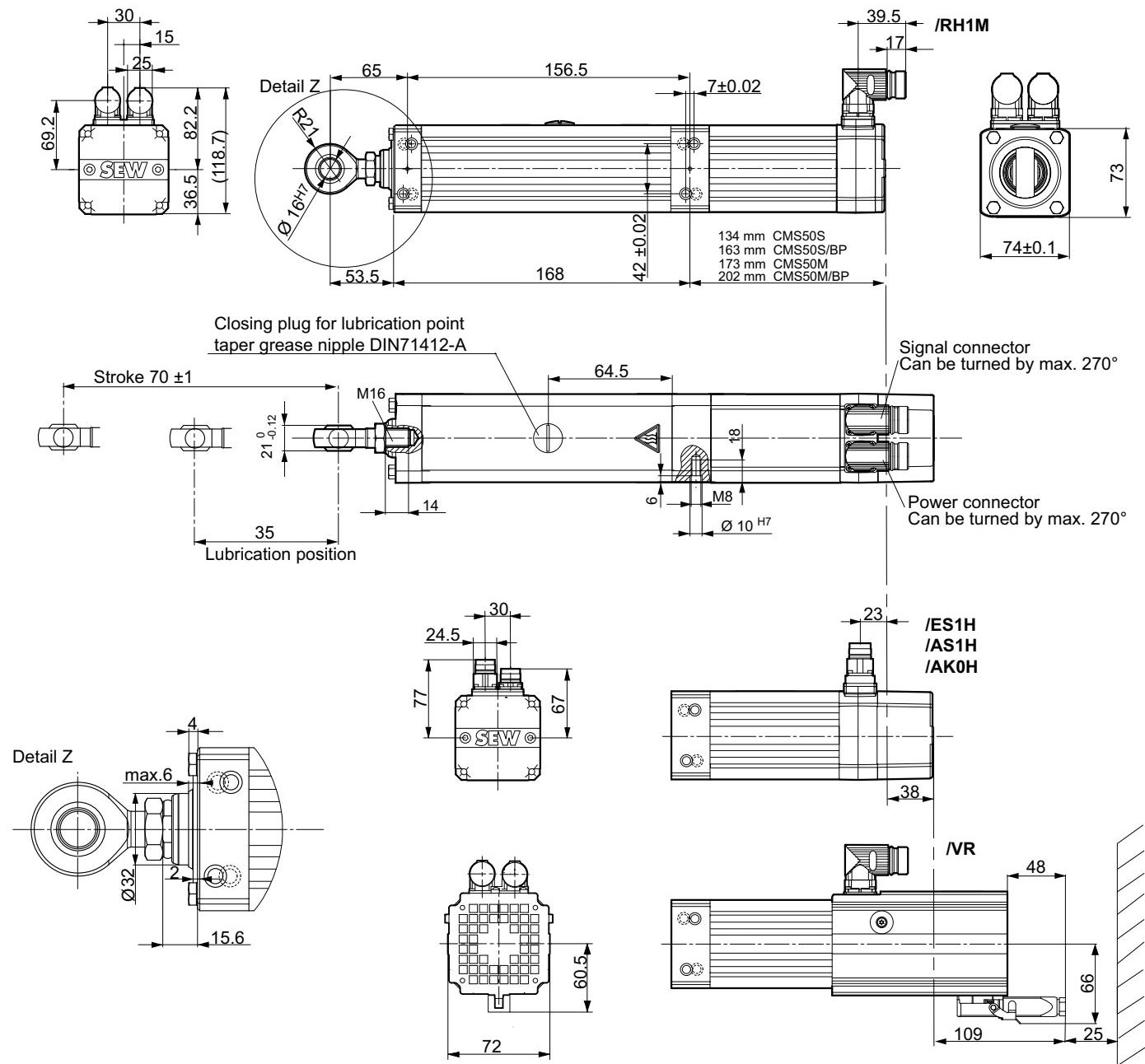
| | |
|----------|-----------|
| <i>P</i> | <i>Hz</i> |
|----------|-----------|

Technical Data

Mounting dimensions of CMS50S/M

9.13 Mounting dimensions of CMS50S/M

9.13.1 Mounting dimensions for a stroke length of 70 mm

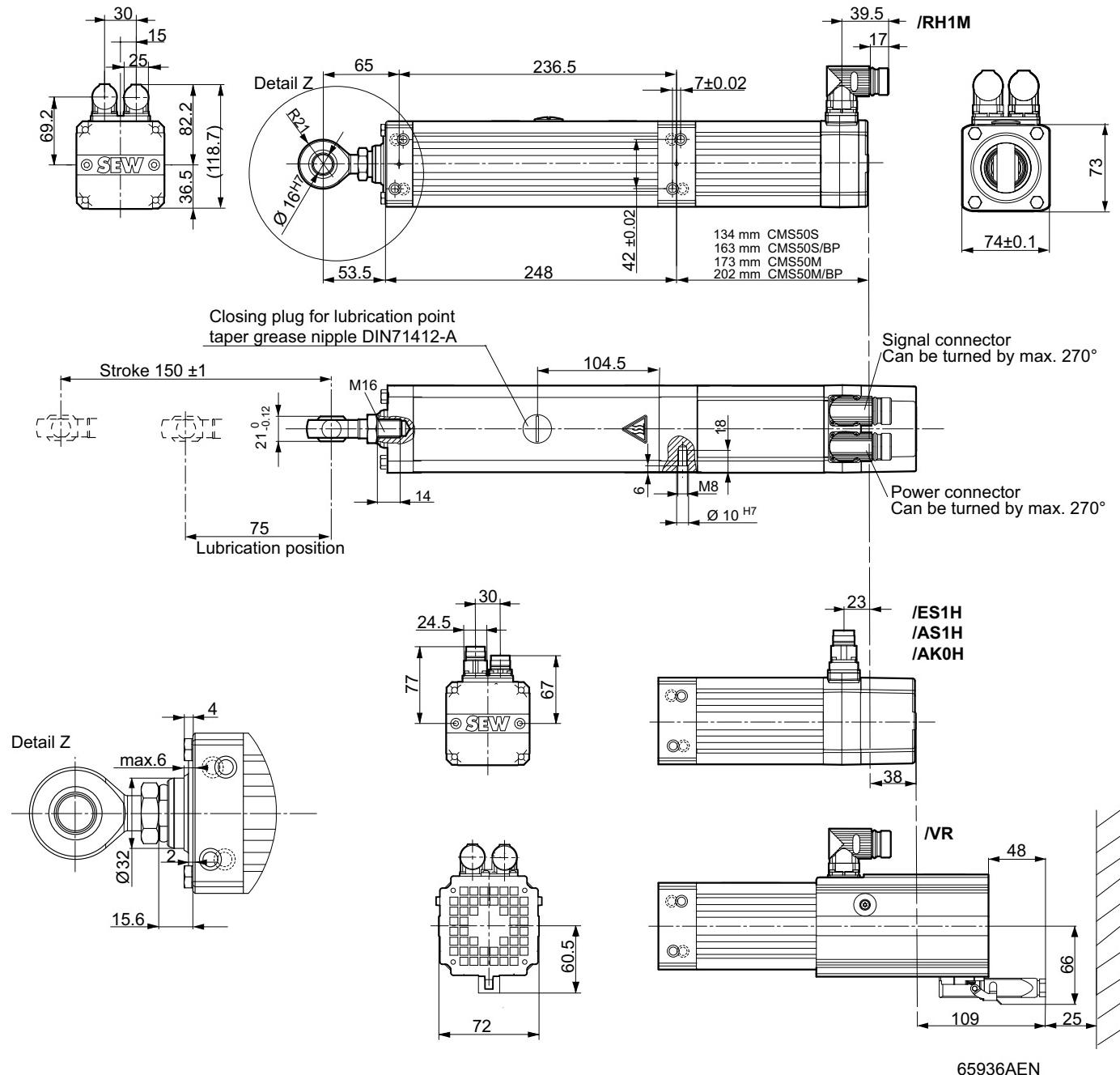


Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.

| Accessory bag (SEW part number: 1333 4204) | |
|--|----------------|
| 4x | Weight: 0.1 kg |
| | |

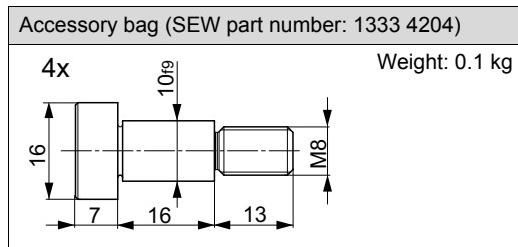
| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

9.13.2 Mounting dimensions for a stroke length of 150 mm



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Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.

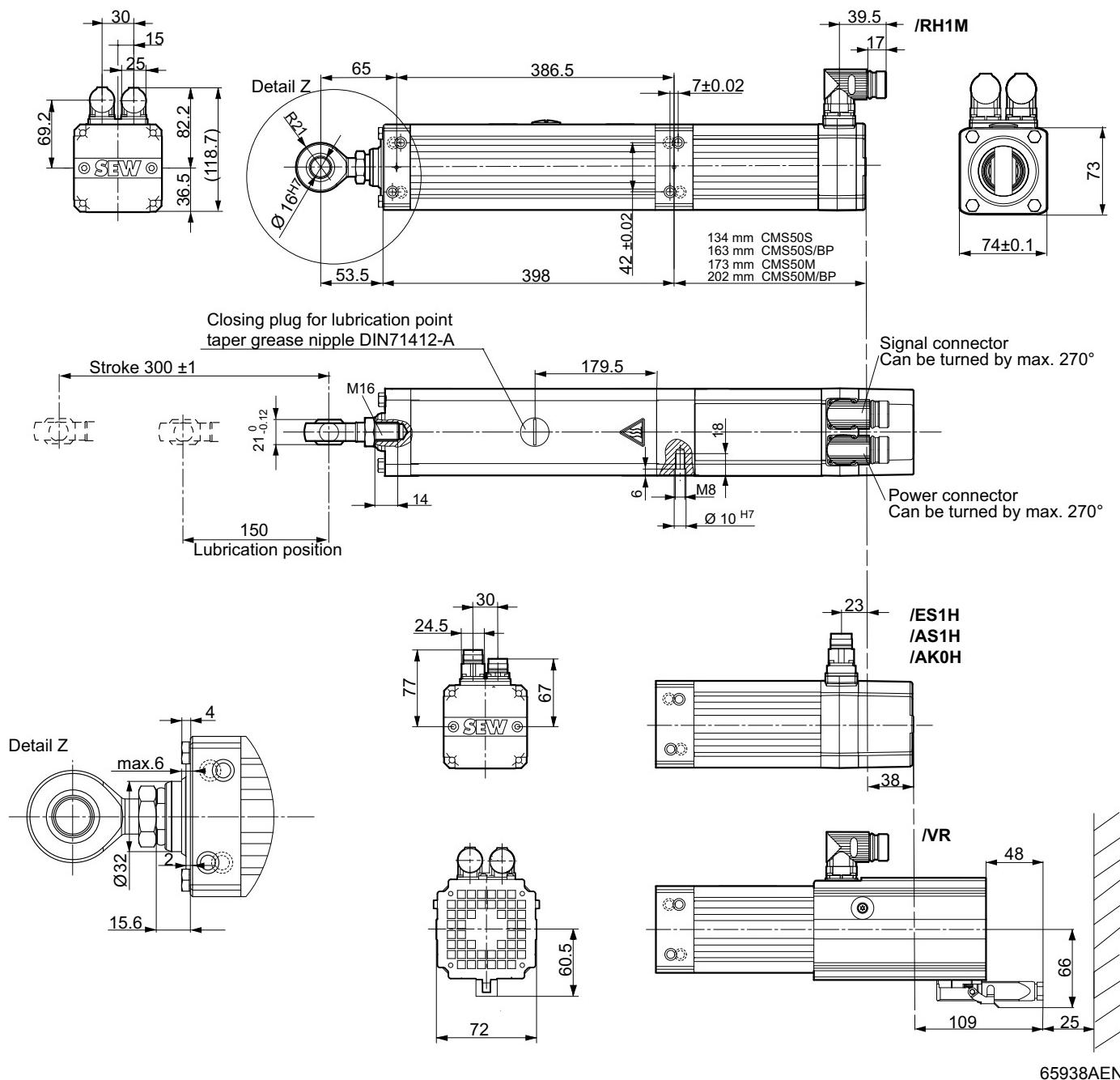


| <i>kVA</i> | <i>n</i> |
|------------|-----------|
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

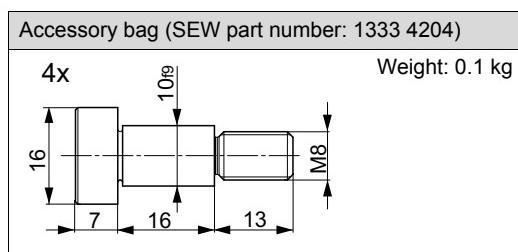
Technical Data

Mounting dimensions of CMS50S/M

9.13.3 Mounting dimensions for a stroke length of 300 mm

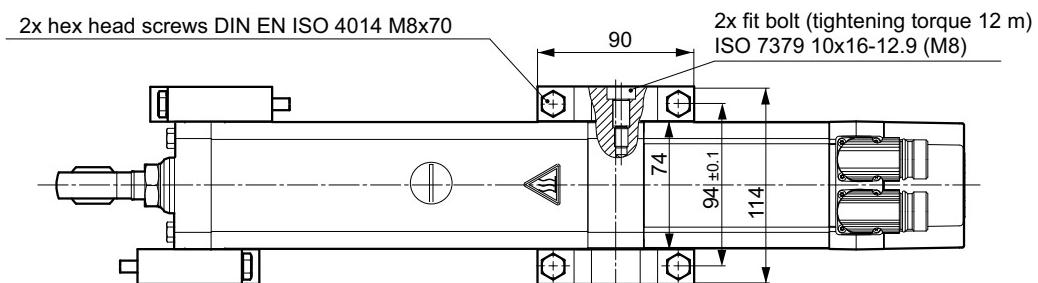
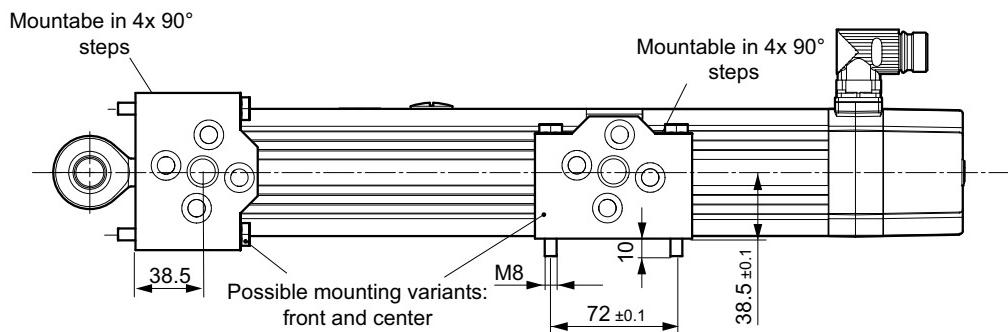
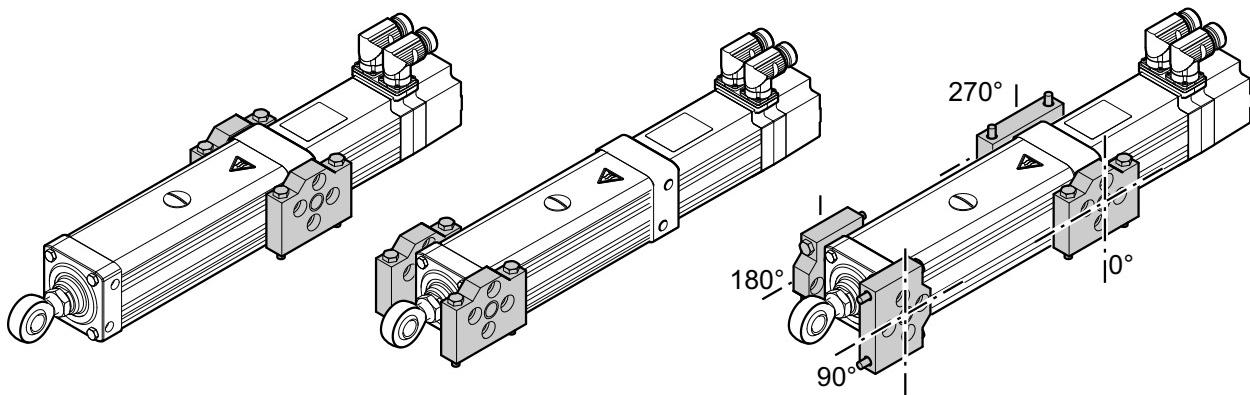


Each CMS50 comes with an accessory bag (with 4 fit bolts) for flange or pivot bearing mounting.



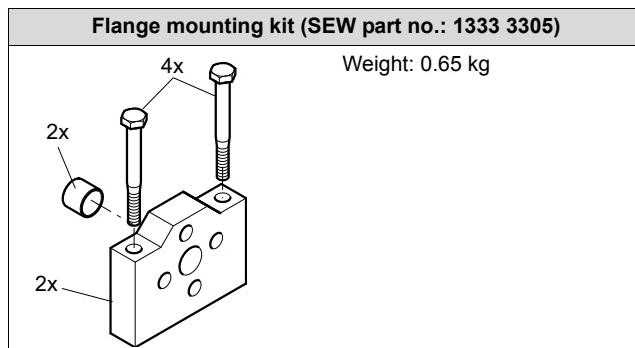
9.13.4 Additional mounting options

Flange mounting The following 3 figures show the mounting options for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components. The mount-on components can be mounted in 90° steps.



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The flange mounting kit consists of the following parts:



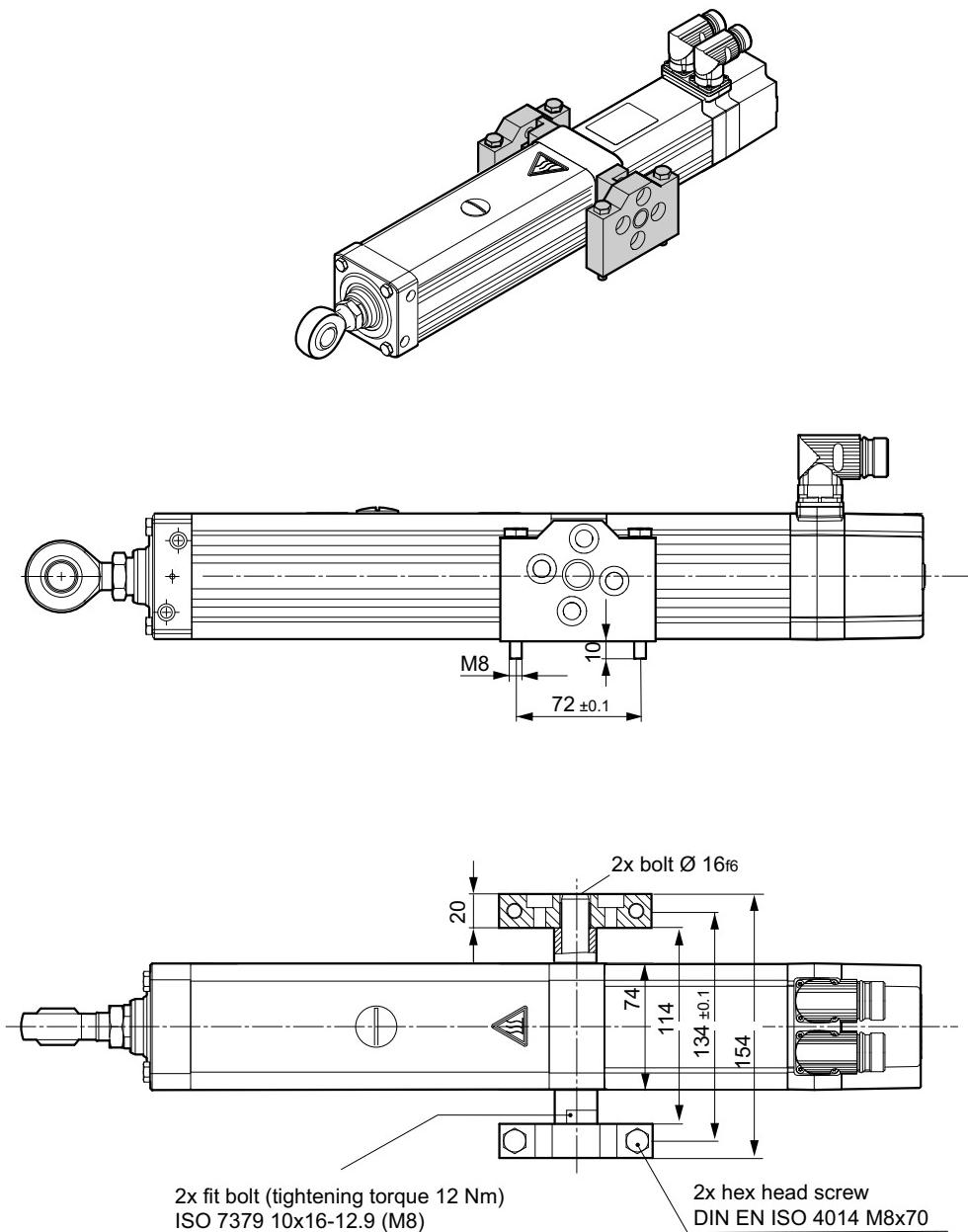
| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

Mounting dimensions of CMS50S/M

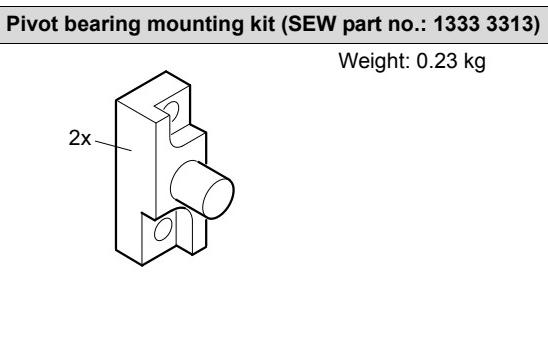
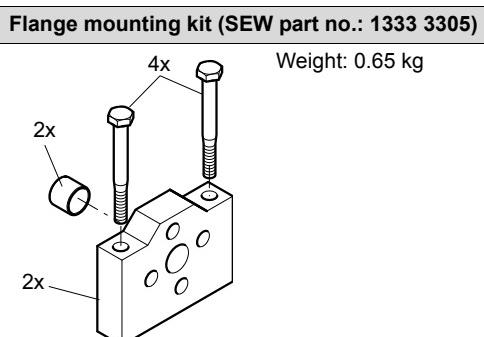
Pivot bearing mounting

The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components.



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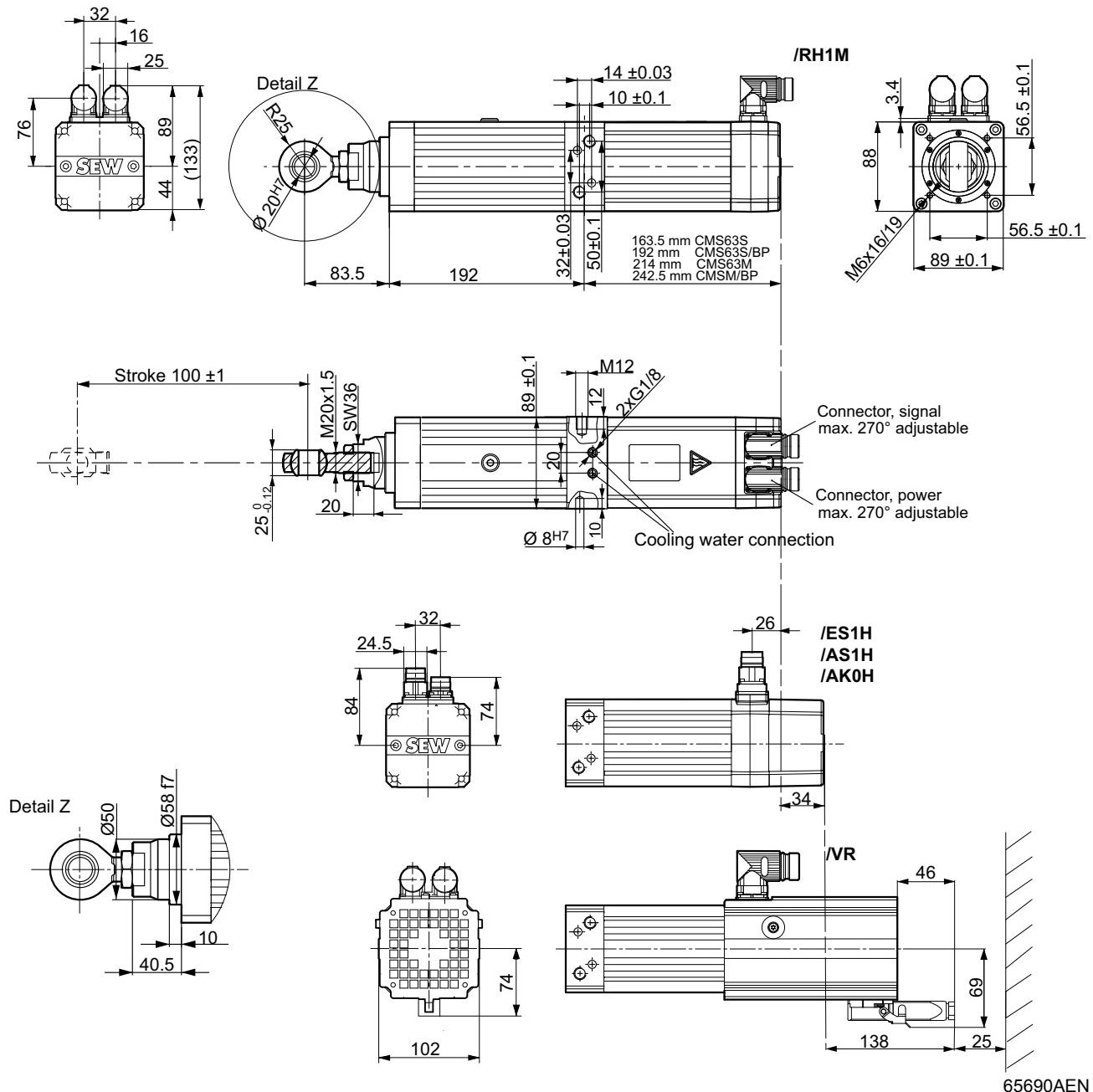
To mount the pivot bearing as shown, you will need the following parts:

| Pivot bearing mounting kit (SEW part no.: 1333 3313) | Flange mounting kit (SEW part no.: 1333 3305) |
|--|---|
|  <p>Weight: 0.23 kg</p> |  <p>Weight: 0.65 kg</p> |

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

9.14 Mounting dimensions of CMS63S/M

9.14.1 Mounting dimensions for a stroke length of 100 mm



Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

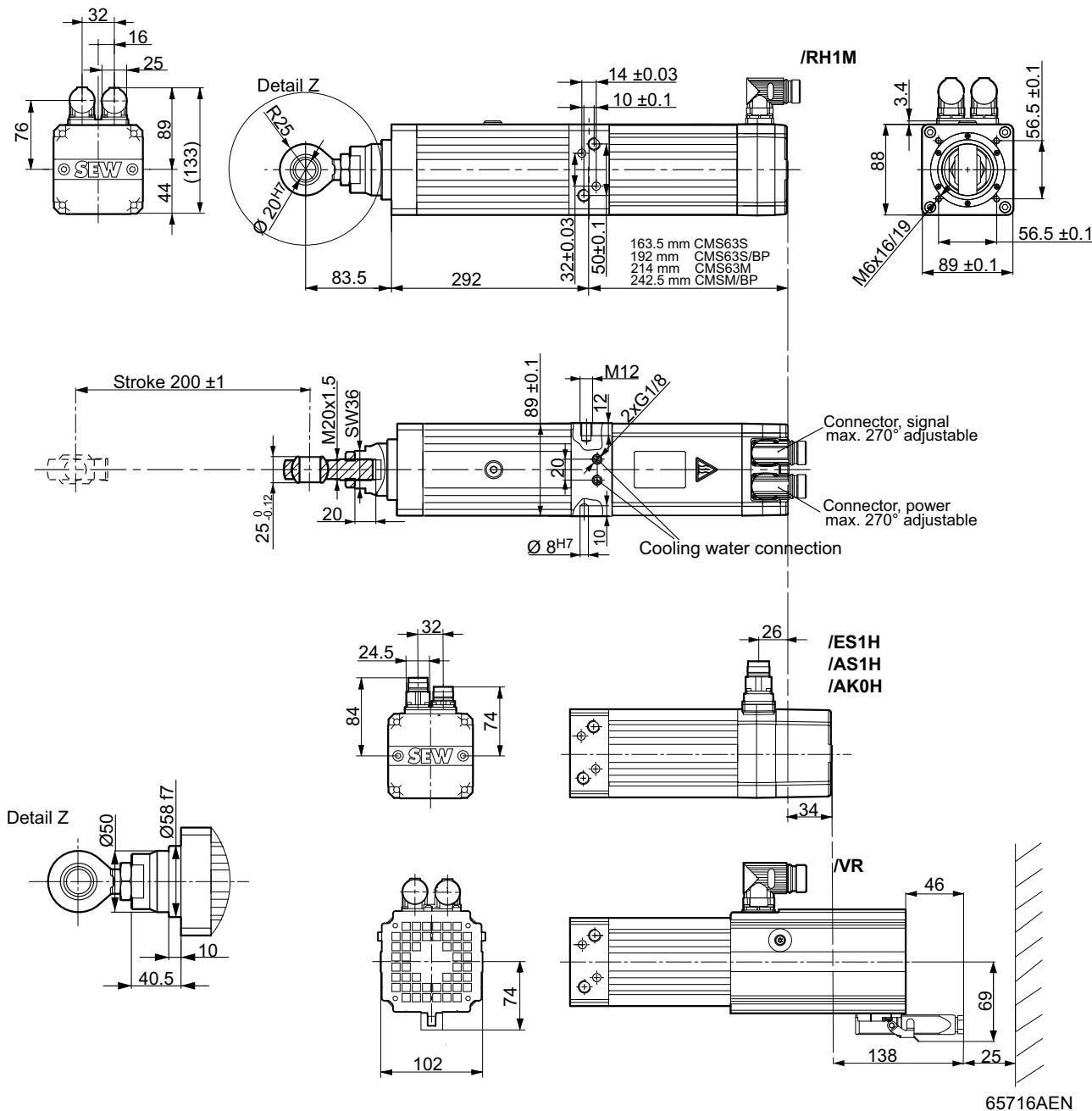
| Accessory bag (SEW part number: 1652 1137) | |
|--|-----------------|
| 4x | Weight: 0.15 kg |
| 4x | |

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

Mounting dimensions of CMS63S/M

9.14.2 Mounting dimensions for a stroke length of 200 mm

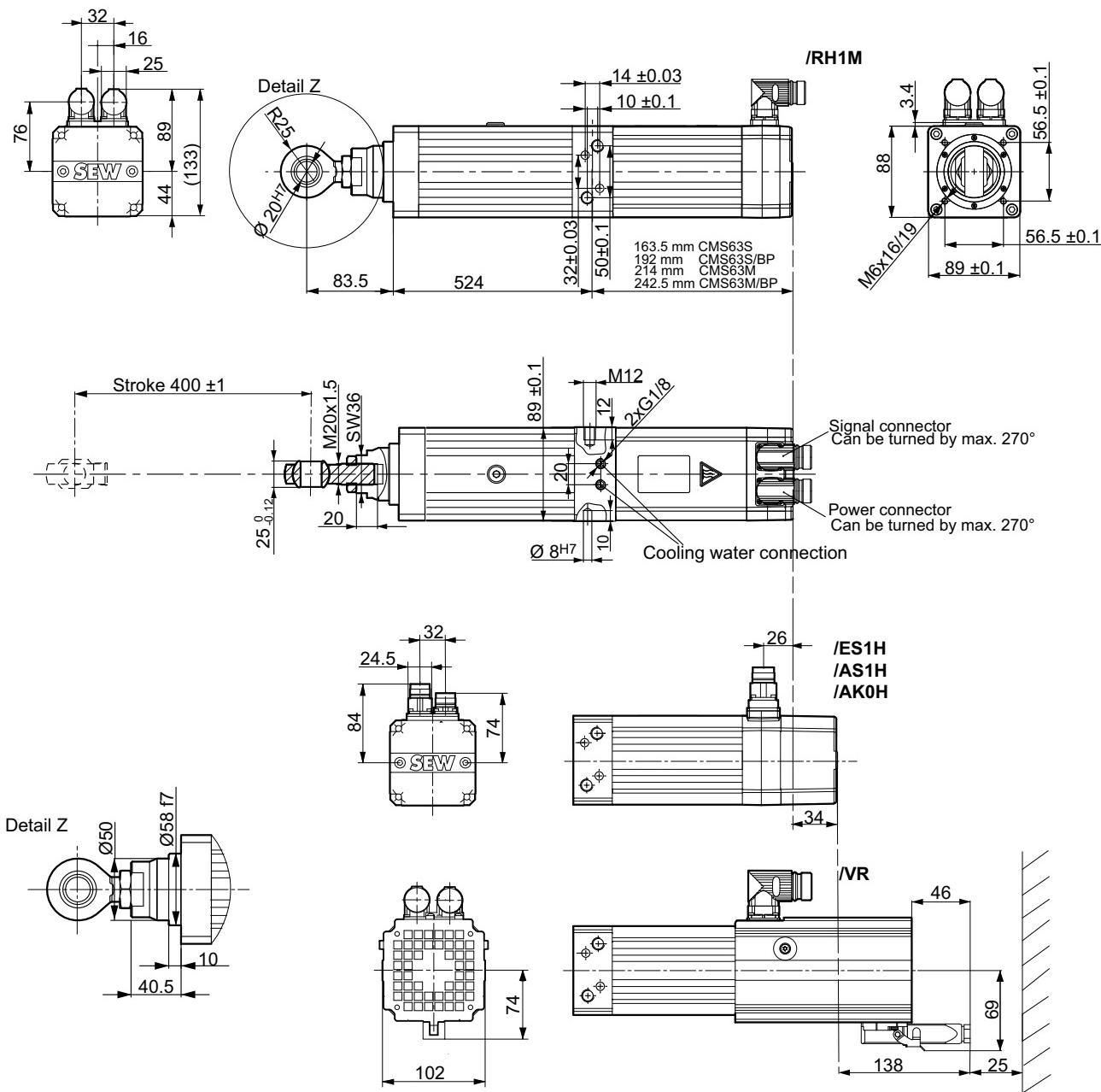


Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

| Accessory bag (SEW part number: 1652 1137) | |
|--|-----------------|
| 4x | Weight: 0.15 kg |

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

9.14.3 Mounting dimensions for a stroke length of 400 mm



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Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

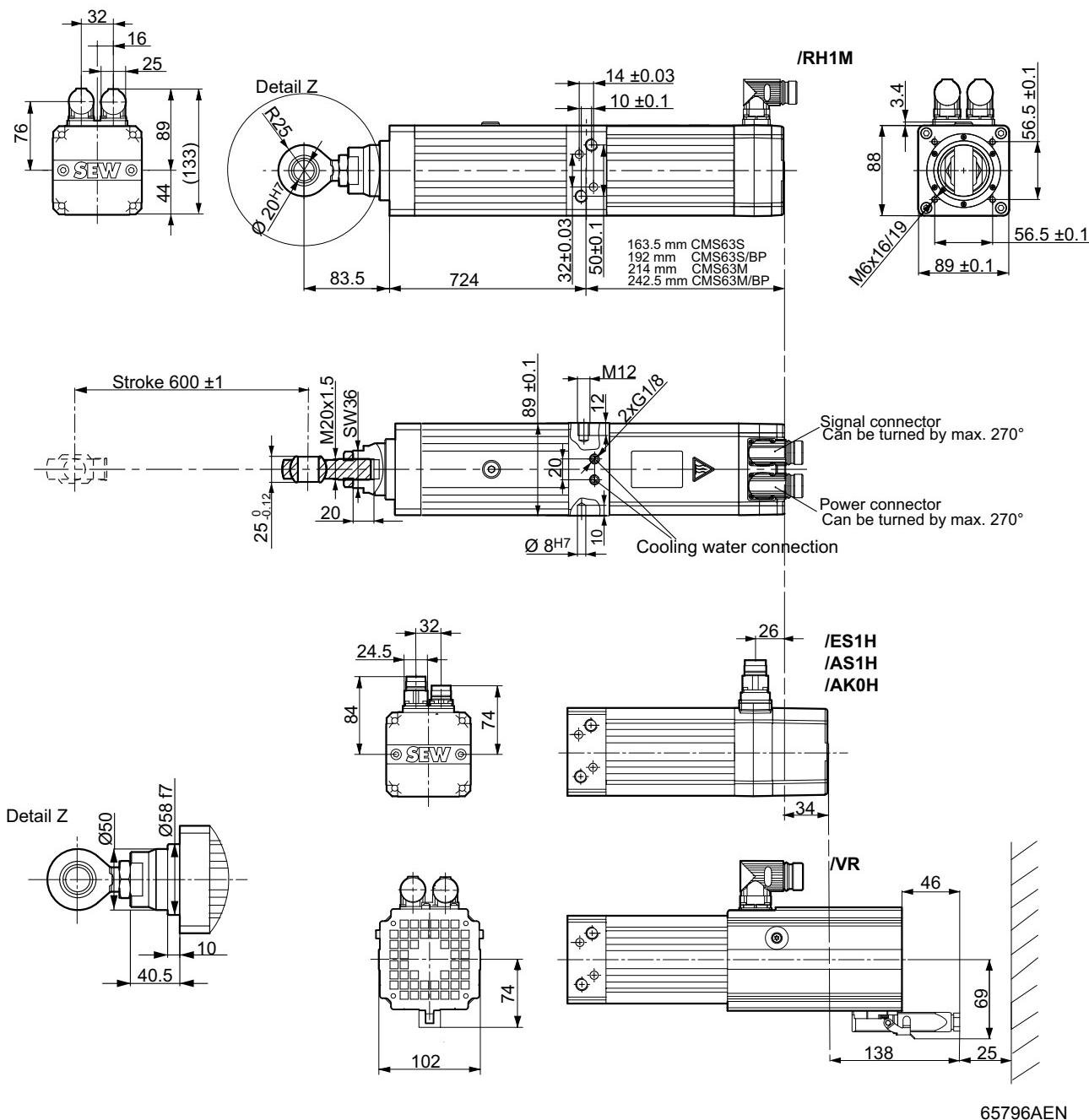
| Accessory bag (SEW part number: 1652 1137) | | Weight: 0.15 kg |
|--|----|-----------------|
| 4x | 4x | |

| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

Mounting dimensions of CMS63S/M

9.14.4 Mounting dimensions for a stroke length of 600 mm



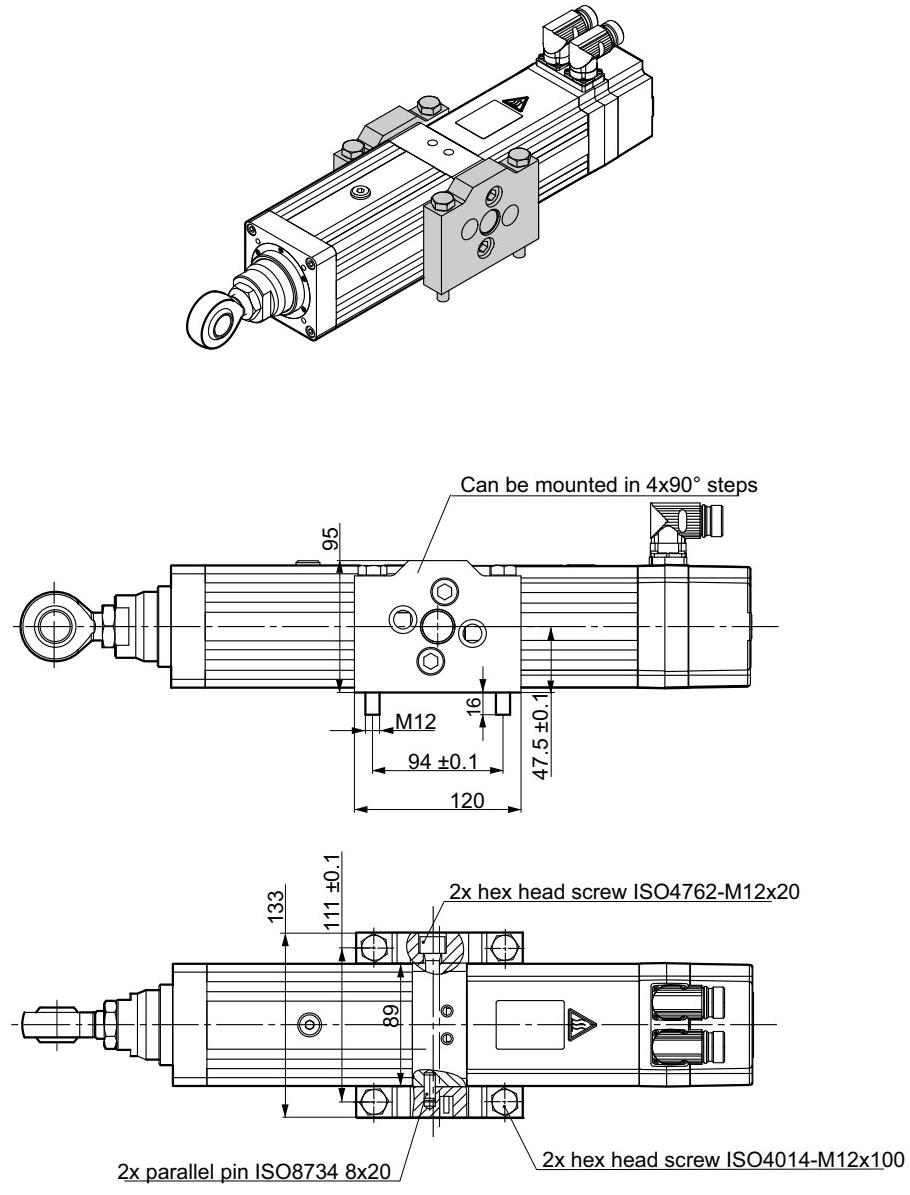
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Each CMS63 comes with an accessory bag for flange or pivot bearing mounting.

| Accessory bag (SEW part number: 1652 1137) | |
|--|-----------------|
| 4x | Weight: 0.15 kg |

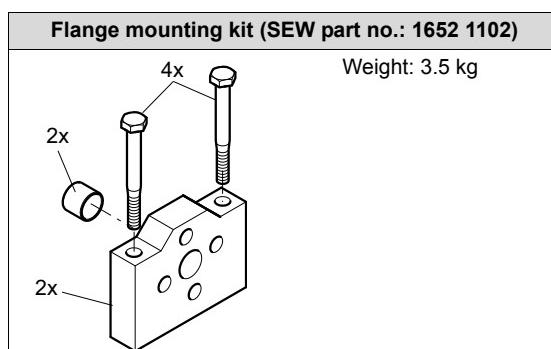
9.14.5 Additional mounting options

Flange mounting The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components. The mount-on components can be mounted in 90° steps.



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The flange mounting kit consists of the following parts:



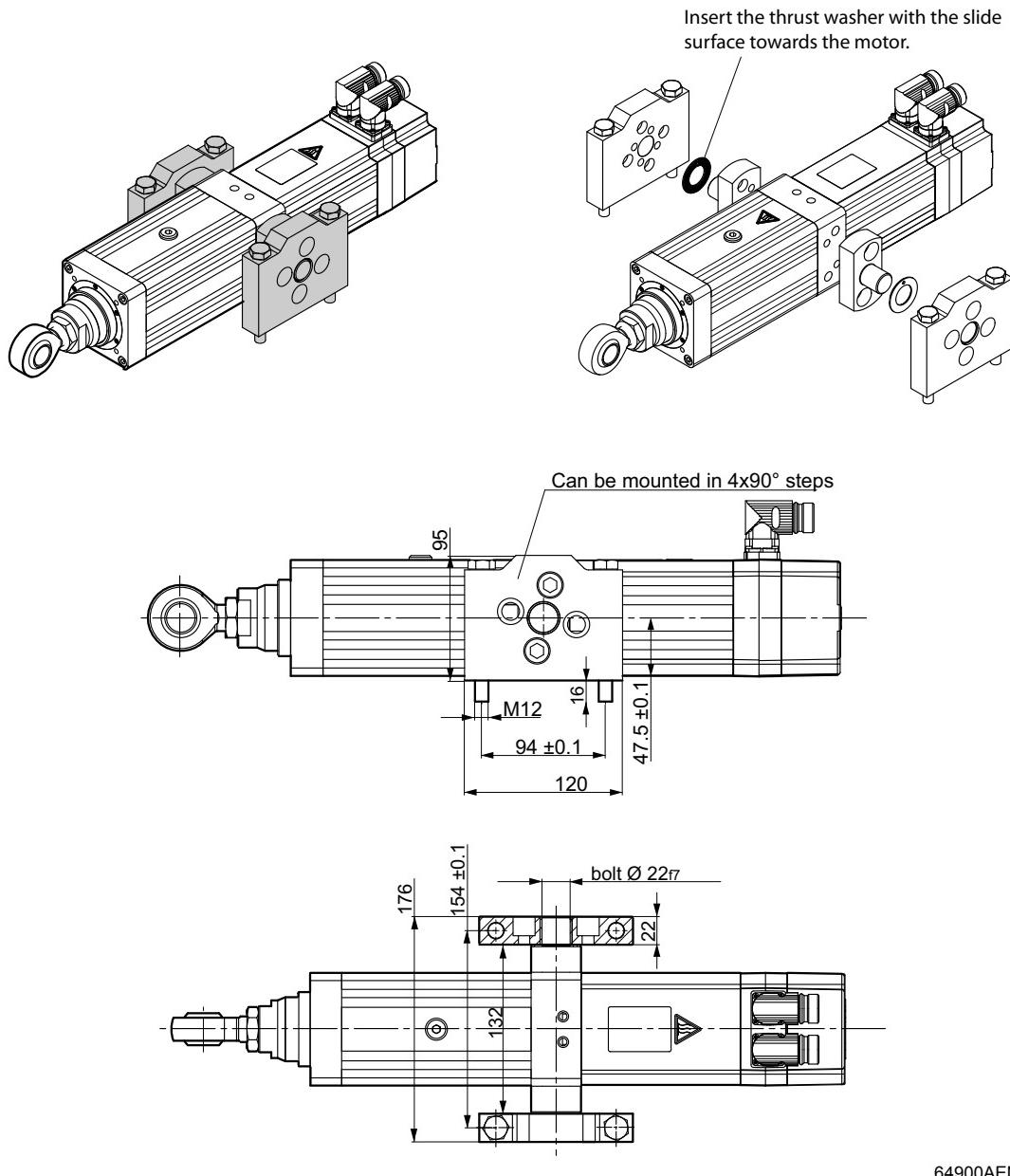
| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

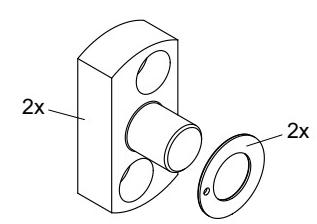
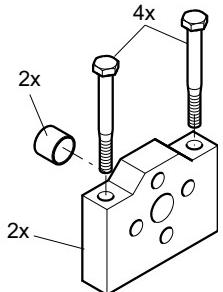
Mounting dimensions of CMS63S/M

Mounting the pivot bearing

The following figure shows the mounting option for the electric cylinder. This should be attached to a mounting surface with the gray-shaded mount-on components.



To mount the pivot bearing as shown, you will need the following parts:

| Pivot bearing mounting kit (SEW part no.: 1652 1129) | Flange mounting kit (SEW part no.: 1652 1102) |
|---|--|
|  <p>Weight: 0.9 kg</p> |  <p>Weight: 3.5 kg</p> |

| | |
|-------|------|
| kVA | n |
| i | f |
| P | Hz |

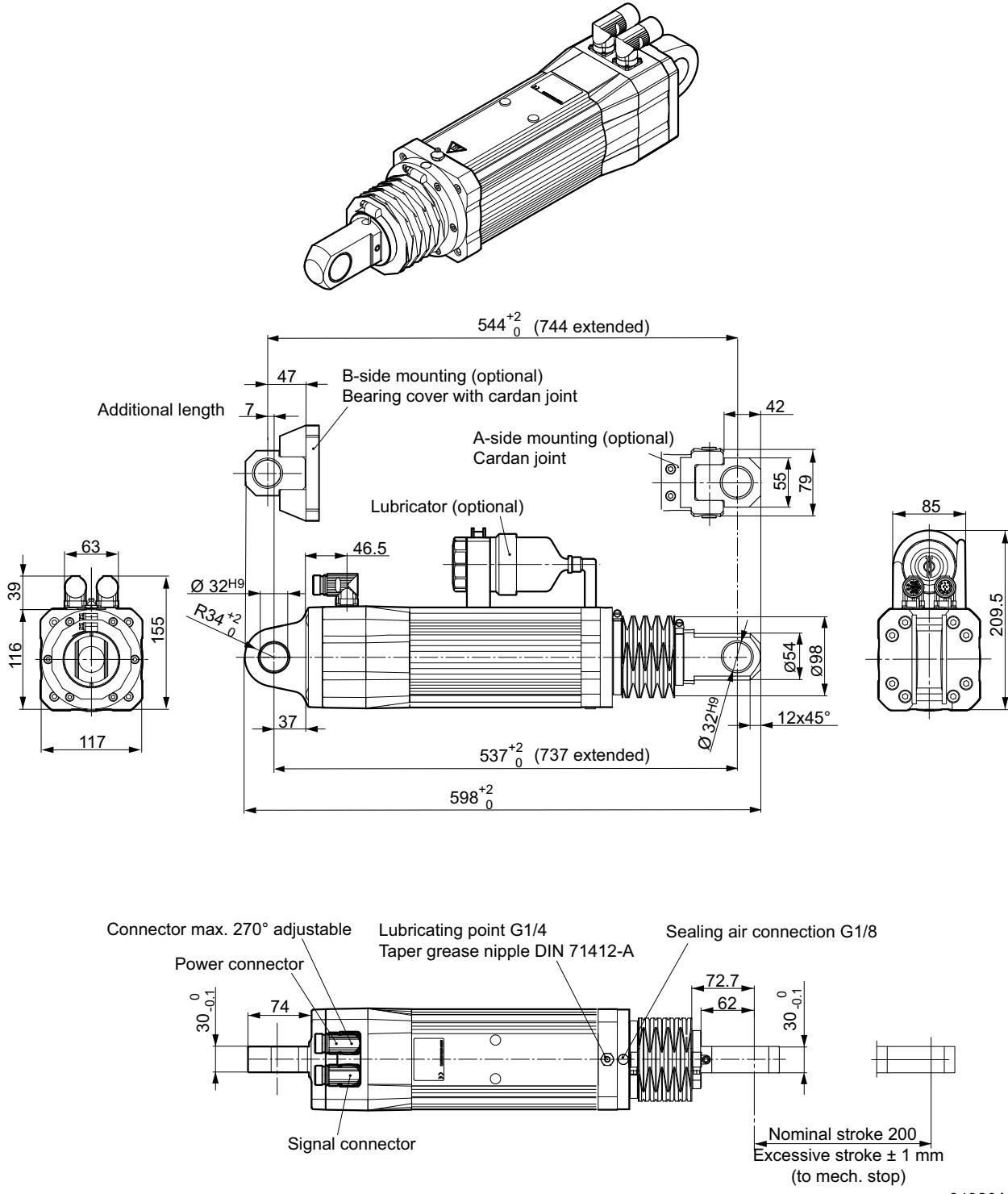
9.15 Mounting dimensions of CMS71L

INFORMATION



CMS71L electric cylinders have the same mounting dimensions in variants with and without brake and with A-side cardan joint or rigid rod end bearing. In the variant with B-side cardan joint, the distance between the two fastening bolts is 7 mm longer.

9.15.1 Mounting dimensions of CMS71L/B/RH1M (resolver) for a stroke length of 200 mm



| | |
|------------|-----------|
| <i>kVA</i> | <i>n</i> |
| <i>i</i> | <i>f</i> |
| <i>P</i> | <i>Hz</i> |

Technical Data

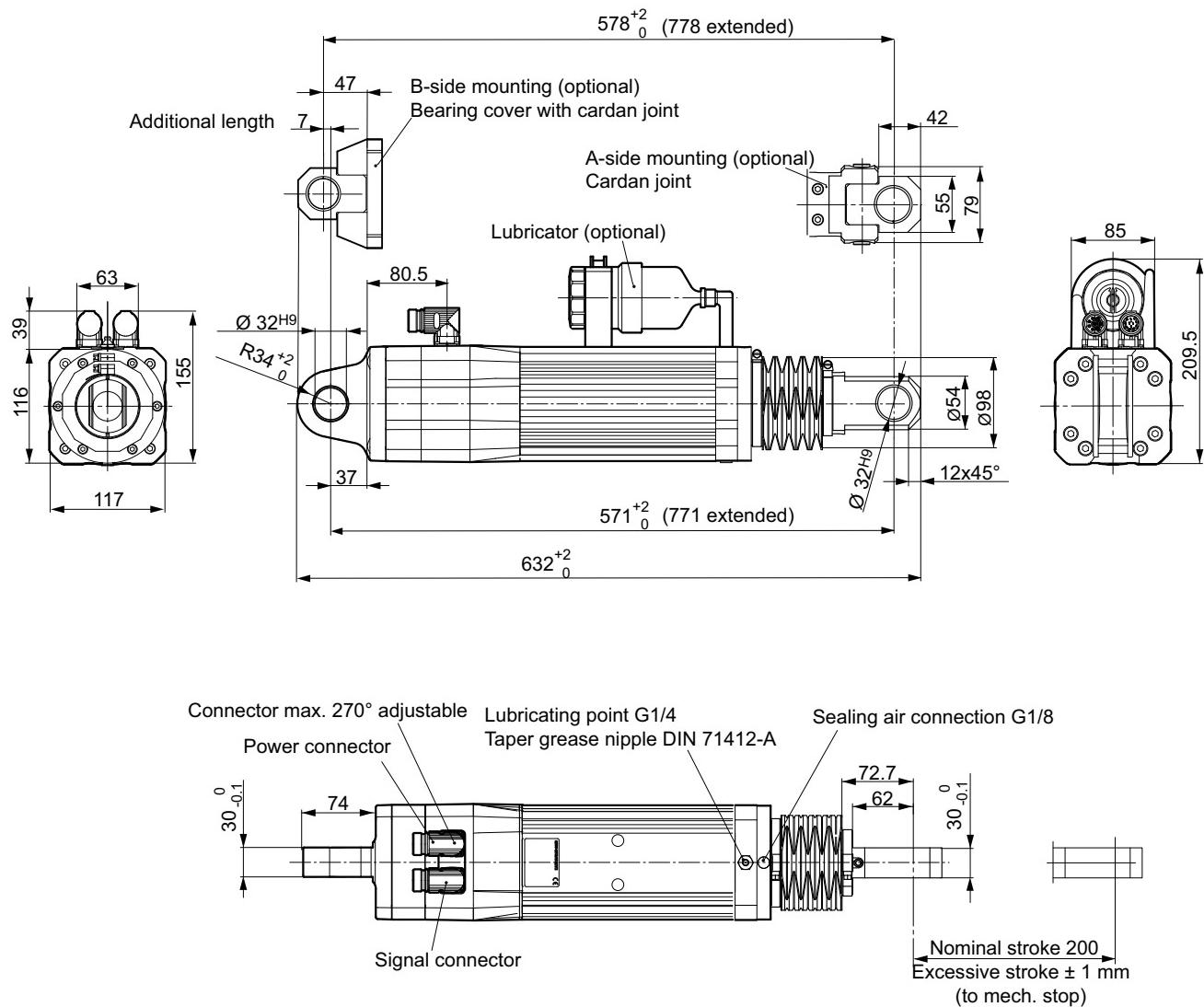
Mounting dimensions of CMS71L

9.15.2 Mounting dimensions of CMS71L/B/AS1H (absolute encoder) for a stroke length of 200 mm

INFORMATION

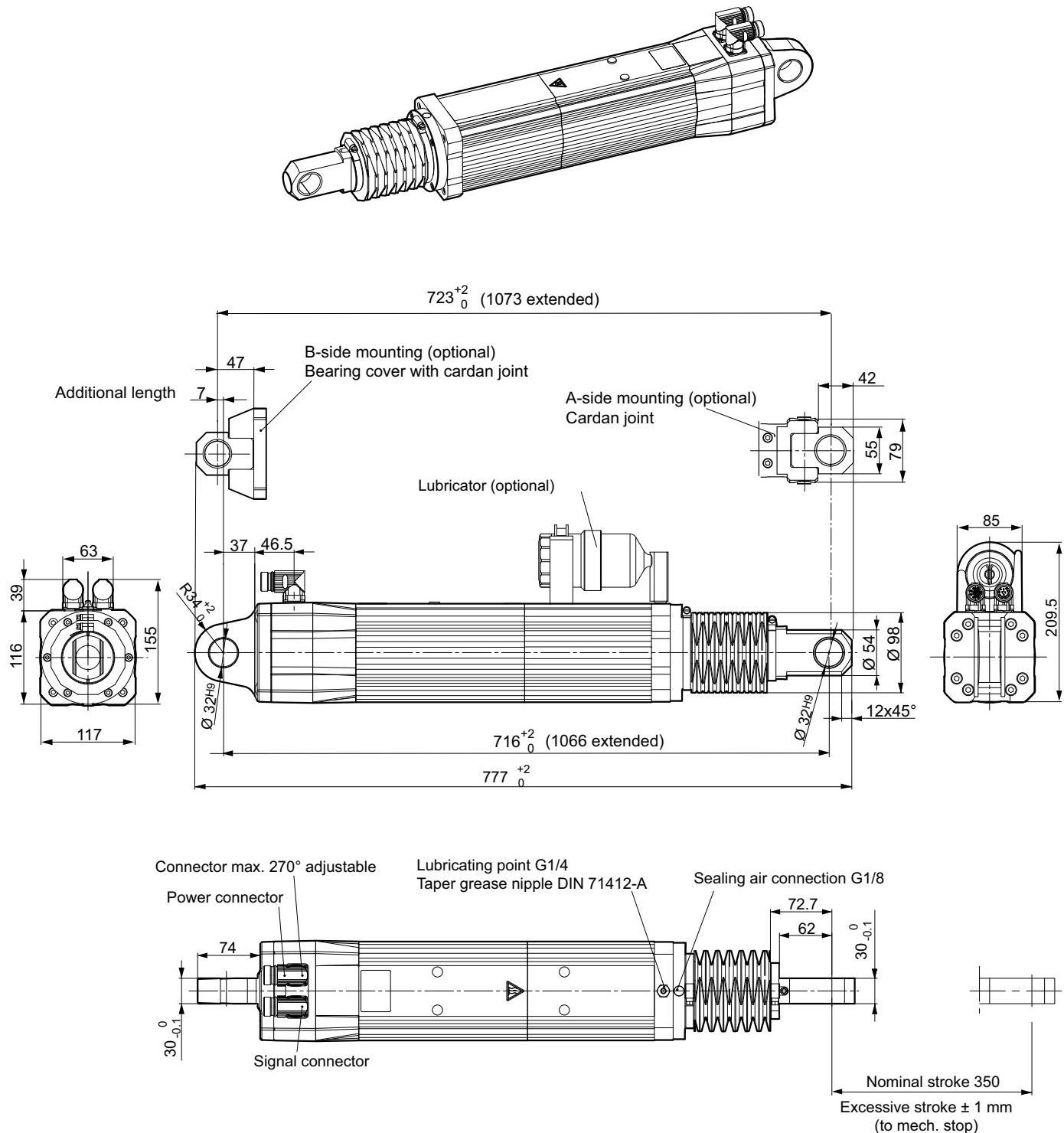


For variants with absolute encoder, the total length is longer by 34 mm.



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9.15.3 Mounting dimensions of CMS71L/B/RH1M (resolver) for a stroke length of 350 mm



| | | |
|-------|-----|------|
| kVA | | n |
| | f | |
| i | | |
| | P | Hz |

Technical Data

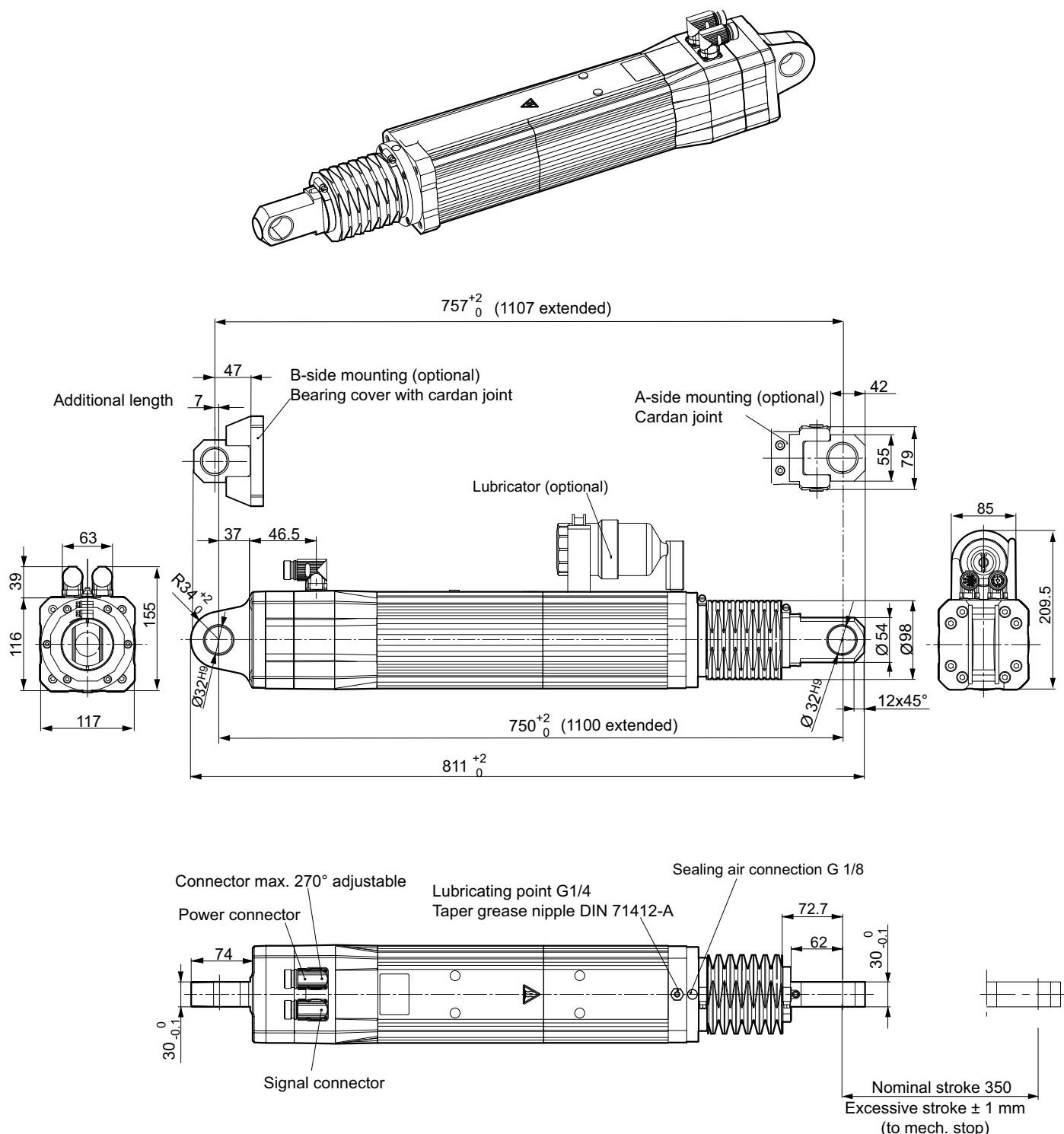
Mounting dimensions of CMS71L

9.15.4 Mounting dimensions of CMS71L/B/AS1H (absolute encoder) for a stroke length of 350 mm

INFORMATION



For variants with an absolute encoder, the total length is longer by 34 mm.



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10 Declaration of Conformity

EG-Konformitätserklärung

EC Declaration of Conformity
Déclaration de conformité CE



SEW
EURODRIVE

Nr./No./Nº 900100007

SEW EURODRIVE GmbH & Co KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal

erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte
declares under sole responsibility conformity of the following products

déclare, sous sa seule responsabilité, la conformité des produits mentionnés ci-après

Elektrozylinder der Baureihe:

Spindle drive motors of the series:
Vérins électriques des séries:

CMS

mit der

with the / respectant la

Niederspannungsrichtlinie:

Low Voltage Directive / Directive Basse Tension:

2006/95/EG
2006/95 EC / 2006/95 CE

angewandte harmonisierte Normen:

applied harmonized standards / Normes harmonisées appliquées

EN 60034-1:2004

EN 60664-1:2003

Ort/Datum
Place/date / Lieu et date

Bruchsal, 24.01.2007

Geschäftsführer Vertrieb und Marketing
Managing Director Sales and Marketing
Directeur général international commercial et marketing

H. Sondermann



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| Assembly Sales Service | Quéretaro | SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Querétaro C.P. 76220 Querétaro, México | Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx |



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|---|------------------------|---|--|
| Sales | Casablanca | Afit Route D'El Jadida KM 14 RP8 Province de Nouaceur Commune Rurale de Bouskoura MA 20300 Casablanca | Tel. +212 522633700 Fax +212 522621588 fatima.haquiq@premium.net.ma http://www.groupe-premium.com |
| Netherlands | | | |
| Assembly | Rotterdam | VECTOR Aandrijftechniek B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-3004 AB Rotterdam | Tel. +31 10 4463-700 Fax +31 10 4155-552 http://www.vector.nu info@vector.nu |
| New Zealand | | | |
| Assembly Sales Service | Auckland | SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland | Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz |
| | Christchurch | SEW-EURODRIVE NEW ZEALAND LTD. 10 Settlers Crescent, Ferrymead Christchurch | Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz |
| Norway | | | |
| Assembly Sales Service | Moss | SEW-EURODRIVE A/S Solgaard skog 71 N-1599 Moss | Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no |
| Pakistan | | | |
| Sales | Karachi | Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi | Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk |
| Peru | | | |
| Assembly Sales Service | Lima | SEW DEL PERU MOTORES REDUCTORES S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima | Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe |
| Poland | | | |
| Assembly Sales Service | Lodz | SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź | Tel. +48 42 676 53 00 Fax +48 42 676 53 45 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl |
| | 24 Hour Service | | Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl |
| Portugal | | | |
| Assembly Sales Service | Coimbra | SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada | Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt |



| Romania | | | |
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| Sales Service | Bucharest | Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti | Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro |
| Russia | | | |
| Assembly Sales Service | St. Petersburg | ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia | Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru |
| Senegal | | | |
| Sales | Dakar | SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar | Tel. +221 338 494 770 Fax +221 338 494 771 senemeca@sentoo.sn http://www.senemeca.com |
| Serbia | | | |
| Sales | Beograd | DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor SCG-11000 Beograd | Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs |
| Singapore | | | |
| Assembly Sales Service | Singapore | SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644 | Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com |
| Slovakia | | | |
| Sales | Bratislava | SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava | Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk |
| | Žilina | SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina | Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk |
| | Banská Bystrica | SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica | Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk |
| | Košice | SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice | Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk |
| Slovenia | | | |
| Sales Service | Celje | Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 3000 Celje | Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net |
| South Africa | | | |
| Assembly Sales Service | Johannesburg | SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013 | Tel. +27 11 248-7000 Fax +27 11 494-3104 http://www.sew.co.za info@sew.co.za |

**South Africa**

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| Cape Town | SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442 Cape Town | Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za |
| Durban | SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605 | Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za |
| Nelspruit | SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200 | Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za |

South Korea

| | | | |
|-------------------------------|-------------------|--|--|
| Assembly Sales Service | Ansan-City | SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate 1048-4, Shingil-Dong Ansan 425-120 | Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com |
| | Busan | SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270 | Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr |

Spain

| | | | |
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| Assembly Sales Service | Bilbao | SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya) | Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es |
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Sweden

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| Assembly Sales Service | Jönköping | SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping | Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se |
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Switzerland

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| Assembly Sales Service | Basel | Alfred Imhof A.G. Jurastrasse 10 CH-4142 Münchenstein bei Basel | Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch |
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Thailand

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| Assembly Sales Service | Chonburi | SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000 | Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com |
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Tunisia

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| Sales | Tunis | T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana | Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn |
|--------------|--------------|--|--|

| Turkey | | | |
|--|-----------------------------|--|--|
| Assembly Sales Service | Istanbul | SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Bagdat Cad. Koruma Cikmazi No. 3 TR-34846 Maltepe ISTANBUL | Tel. +90 216 4419163 / 4419164 Fax +90 216 3055867 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr |
| Ukraine | | | |
| Sales Service | Dnepropetrovsk | SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk | Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua |
| United Arab Emirates | | | |
| Sales Service | Sharjah | Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah | Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae |
| USA | | | |
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| Assembly Sales Service | Northeast Region | SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014 | Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com |
| | Midwest Region | SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373 | Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com |
| | Southwest Region | SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237 | Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com |
| | Western Region | SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544 | Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com |
| Additional addresses for service in the USA provided on request! | | | |
| Venezuela | | | |
| Assembly Sales Service | Valencia | SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo | Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net |
| Vietnam | | | |
| Sales | Ho Chi Minh City | Nam Trung Co., Ltd 91 - 93 Tran Minh Quyen Street, District 10, HCMC | Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn |



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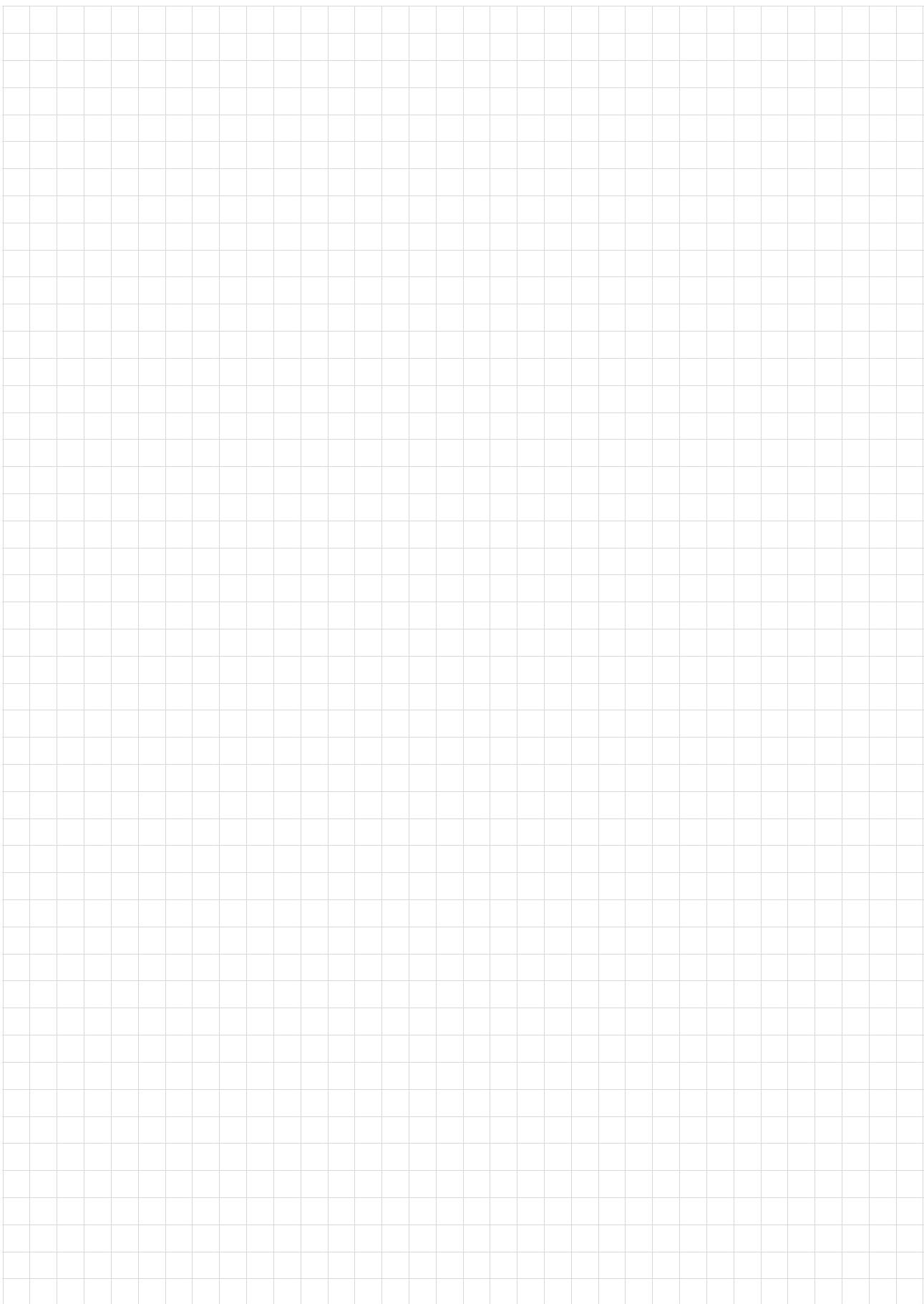
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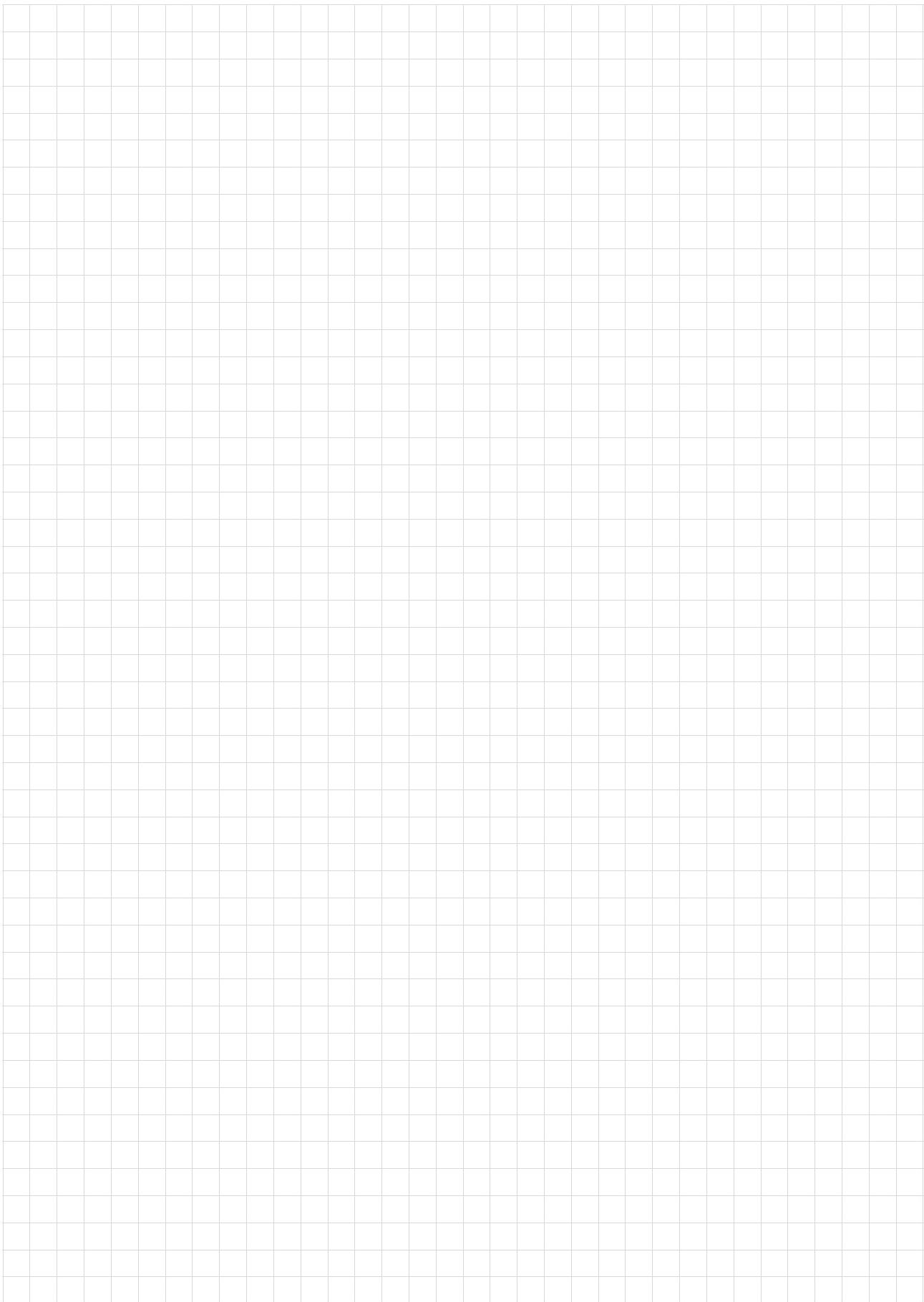
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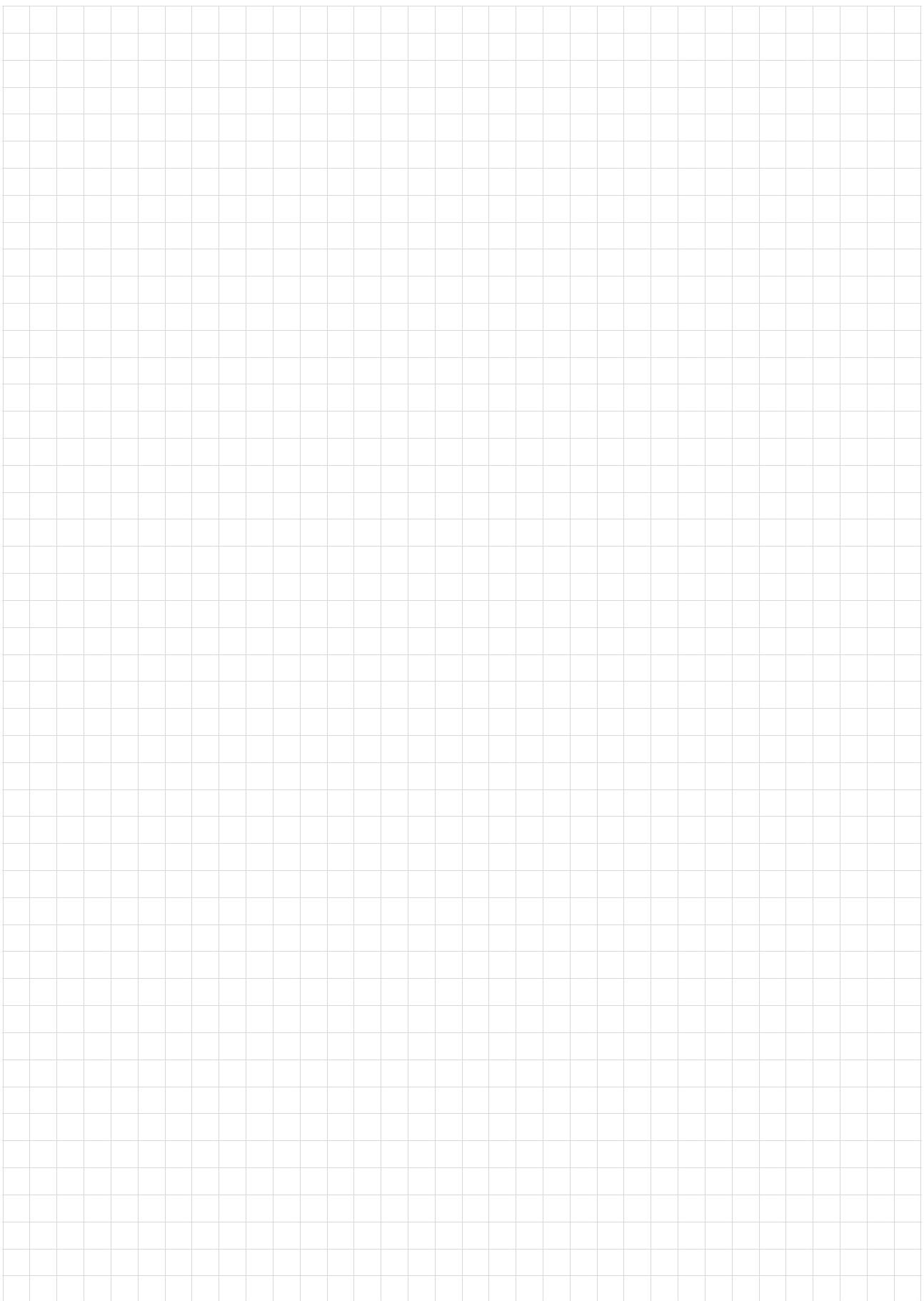
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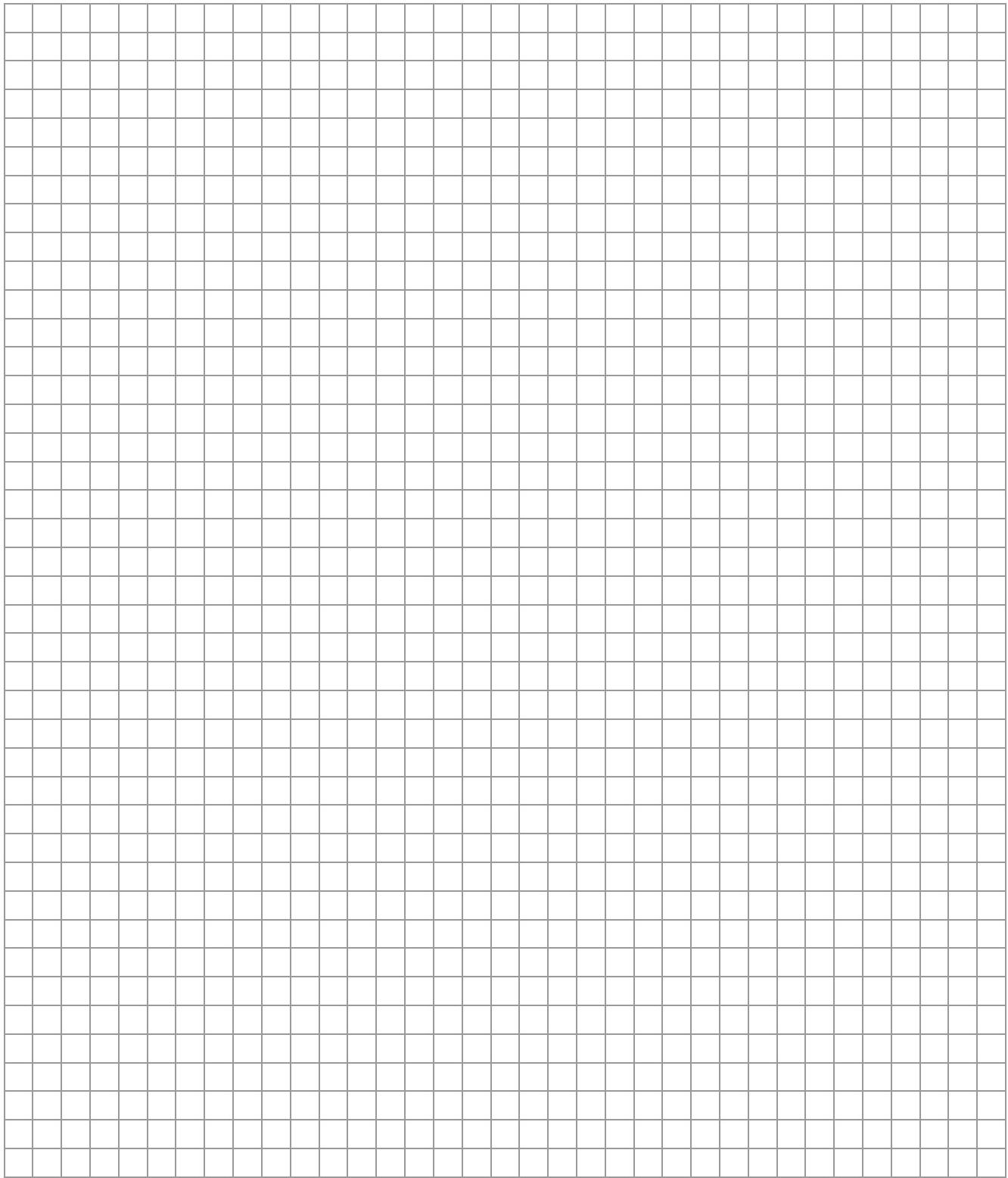


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